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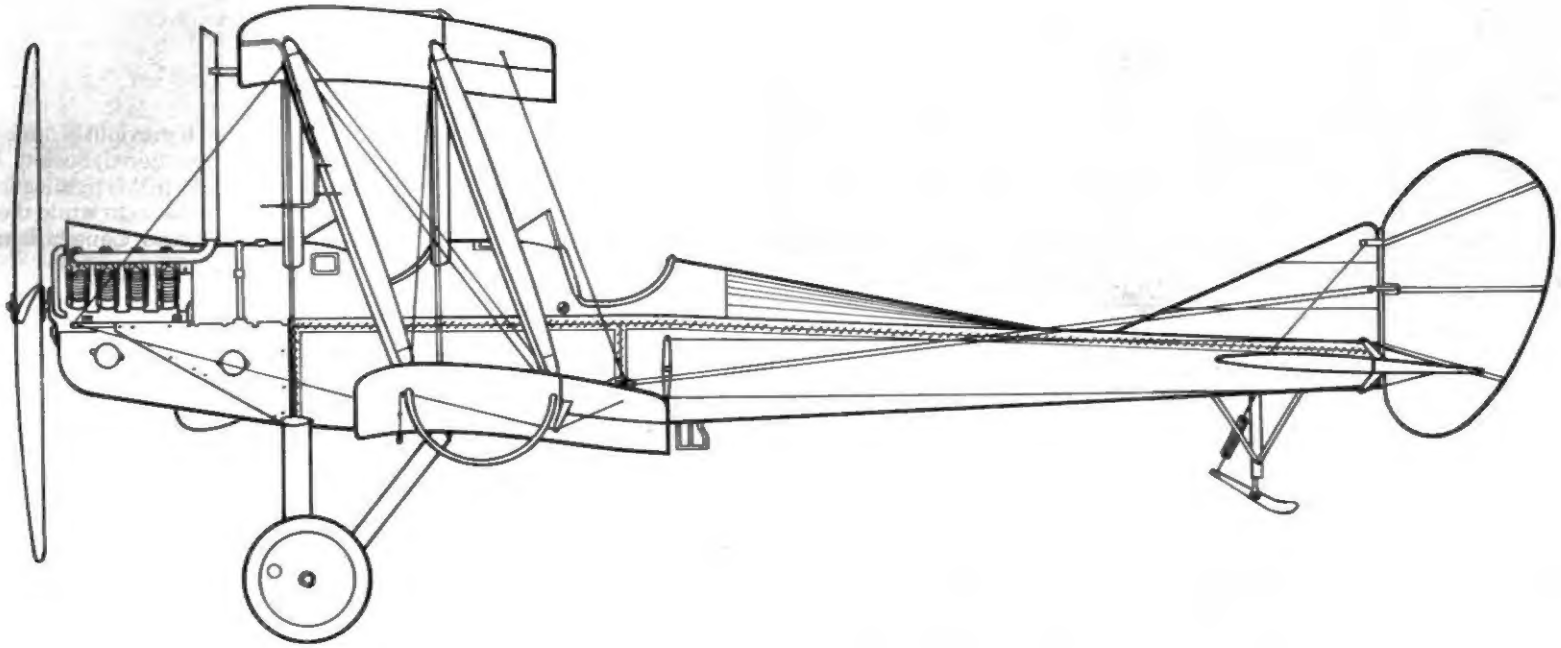
BE2 in action

Aircraft Number 123

squadron/signal publications

BE2 in action

by Peter Cooksley
Color by Don Greer
Illustrated by Joe Sewell



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A BE2e of No 16 Squadron, Royal Flying Corps, is stalked by a Red Albatross fighter flown by Baron Manfred von Richthofen. The German ace shot down the BE2e, flown by LTs K.I. MacKenzie and G. Everingham, killing both crewmen. It was his 39th victory.

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Dedication

This volume is humbly dedicated to the memory of the young men who died flying machines such as these.

This presentation BE2c (2509) flew with No 16 Squadron during September of 1916. It was transferred to No 2 Squadron in October and remained in service until October of 1918. The aircraft was paid for by Mrs. H.P. Stromberg of New York City.

Introduction

In 1909, the British War Office decided to abandon development of powered aircraft at His Majesty's Balloon Factory in Farnborough, Hampshire and to dispense with the services of the factory's two designers, S. F. Cody and J. W. Dunne. Their reasoning was that the whole program had proved to be far too costly. By December of the following year, they realized that this decision had been a serious mistake and a new aircraft was purchased from Mr. Geoffrey de Havilland, who was also appointed assistant designer and test pilot.

One of his responsibilities at Farnborough was the repair of damaged aircraft. A crashed Bleriot was sent in for repair and as it turned out, the damage was so extensive that when it rolled out after rebuilding, it was a completely new aircraft with a very different configuration. Mr. de Havilland had used the Bleriot as a test bed to try out his own designs and ideas.

This same method of improvement and design changes was followed by de Havilland and his chief, F. M. Green, during April of 1911 when a damaged Voisin was "reconstructed," emerging as an entirely new aircraft. The only parts remaining from the Voisin were the 60 hp Wolseley engine, radiator, fuel tanks and wing root parts. The new aircraft was designated the BE1, as an acknowledgement of the work of Louis Bleriot in developing aircraft that used tractor airscrews (propellers). The new machine was to prove of great historical importance. It was the first flying machine specifically designed for military use, since the aircraft was intended for army service. The BE1 made its first flight during early December of 1911. Its most striking feature was its surprising lack of noise. As a result, it was quickly dubbed " the silent aircraft."

The test program which followed resulted in a number of changes and modifications.

The original BE1 was powered by a 60 hp Renault in-line engine. Considerable attention had been paid to reducing the aircraft's drag, and the lower wing was slightly shorter than the upper wing.

The mainplane rigging and main landing gear were modified and a smaller horizontal stabilizer was installed. Later, a 60 hp Renault engine was fitted which did away with the need for the massive radiator that had almost completely obscured the forward view of the two man crew.

Once its capabilities had been proven, the BE1 was pressed into service for experimental work. It was to enjoy a comparatively lengthy career, although the number of crashes in which it was involved probably meant that after a short time there was very little left of the original airframe.

With a maximum speed of 59 mph and a time to climb to 600 feet of three minutes fifty-four seconds, the BE1 obviously had potential for use as an Army aircraft for both reconnaissance and artillery spotting. In early Spring of 1912, the aircraft was officially taken on charge by the Royal Flying Corps. At different periods during 1913, it was on strength with both Nos 2 and 3 Squadrons before returning to Farnborough during the Summer of the following year. At this time it was assigned to No 4 Squadron.

The Royal Flying Corps felt that the developmental potential of the aircraft was considerable and, although only one example ever existed, the re-named Army Aircraft Factory was given permission to construct a new variant that would incorporate the lessons learned in the testing of the BE1.

This variant received the designation BE2 since it was the second aircraft in the BE series. The BE2 differed very little from the BE1 except for the power plant. The aircraft was fitted with a 70 hp Renault in-line engine and made its first flight on 1 February 1912. During this flight, the aircrew noted that the BE2's takeoff and climb were superior to those of the BE1.

Just under two months later, the BE2 was modified to carry one of the first airborne radio transmitters. The aircraft was used to control the first artillery shoot corrected from the air in an exercise conducted at the Salisbury Plain. CAPT H. P. T. Lefroy of the Royal Engineers acted as observer and Geoffrey de Havilland flew the aircraft. De Havilland, also flew the BE2 in an experiment aimed at testing the aircraft in a seaplane configuration. The float trials were conducted at Fleet Pond near Aldershot and were not very successful. The pond was too shallow and, although the aircraft did fly, the floats were damaged on landing.

The BE2 unofficially took part in the Military Aircraft Trials at Larkhill. The downward sections of the exhaust stacks were routed inside the fuselage and passed through the flooring of the nose section.

As an official design, the BE type was not allowed to enter the Military Aeroplane Competition of August 1912. Even so, the aircraft was ordered into production, although only a small number were actually produced by the Royal Aircraft Factory. The remainder of BE2 production was undertaken by private contractors. This enabled the RAF to concentrate on the scientific development of other heavier-than-air machines.

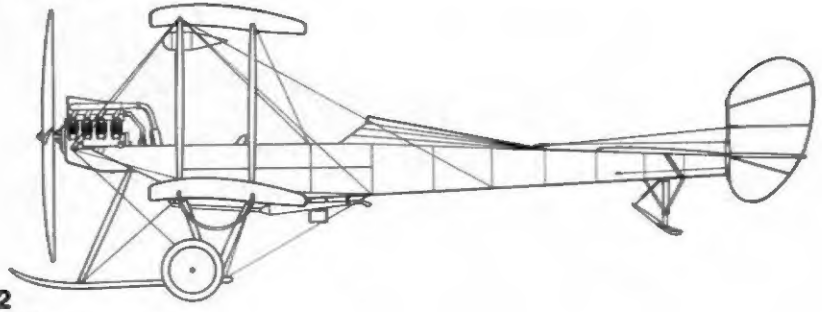
The BE2 was capable of reaching an altitude of 10,560 feet with a useful load of 450 pounds. During the aircraft's unofficial participation in the Military Trials, it had demonstrated an ability to climb to 10,000 feet at a rate of 365 feet per minute. The BE2 scored fifth in the gliding trials and sixth in the speed trials (at 70 mph). Its speed (before stall) in the slow speed test was 49 mph.

The ultimate fate of the BE1 is obscure; however, it is known that it underwent several engine changes, the last being an 80 hp Renault. By November of 1914 it had been issued an official serial number, 201, and the last official reference to the aircraft was during July of 1916 when it was at the Central Flying School (fitted with a BE2b fuselage).

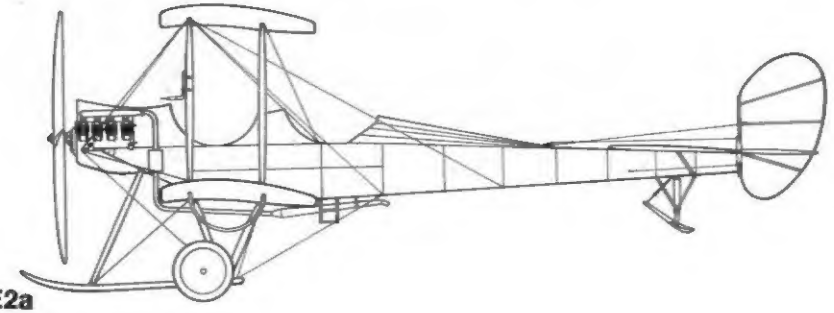
Geoffrey de Haviland prepares the BE2 for a test flight during March of 1913. This BE2 was built by the Royal Aircraft Factory, although a number of others were produced by sub-contractors.

The BE2 was later modified with the exhaust stacks reconfigured to be entirely external. The area between the cockpits was protected by a short decking although there was no decking behind the engine.

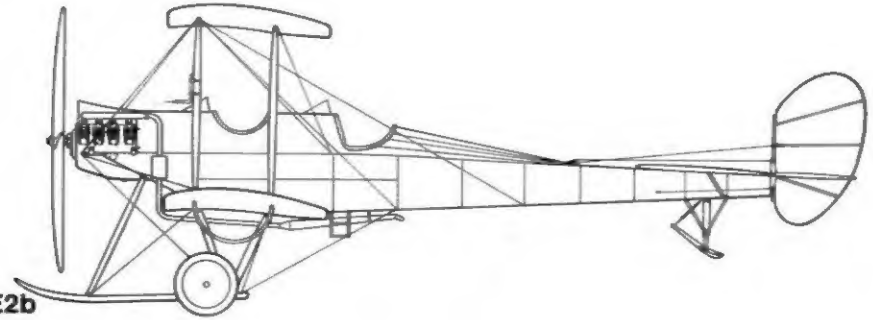
Development



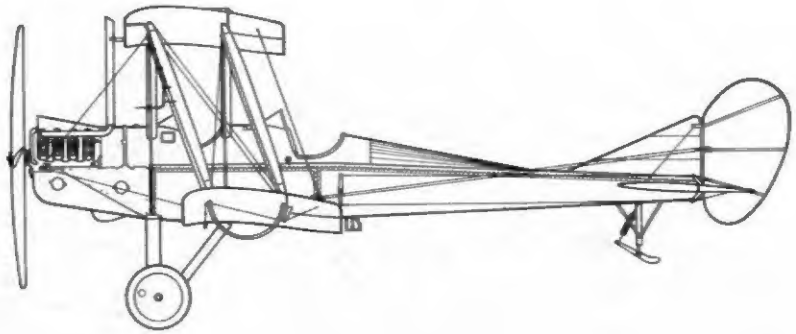
BE2
(Early)



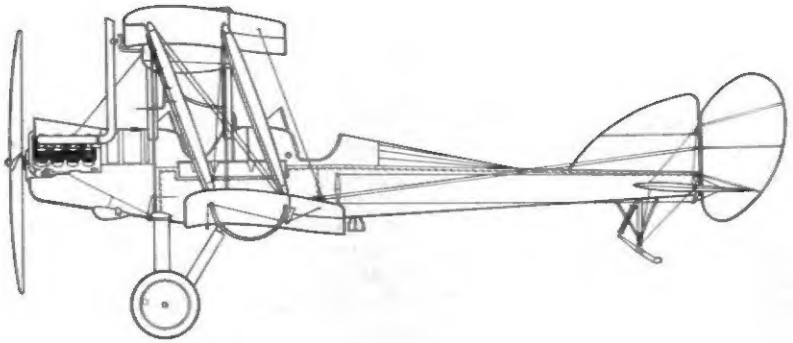
BE2a



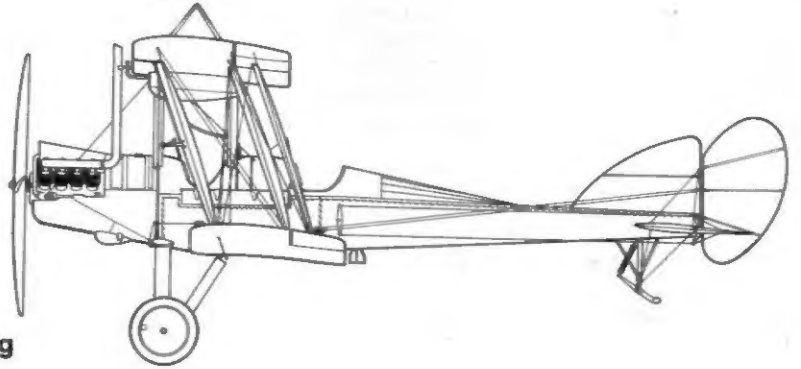
BE2b



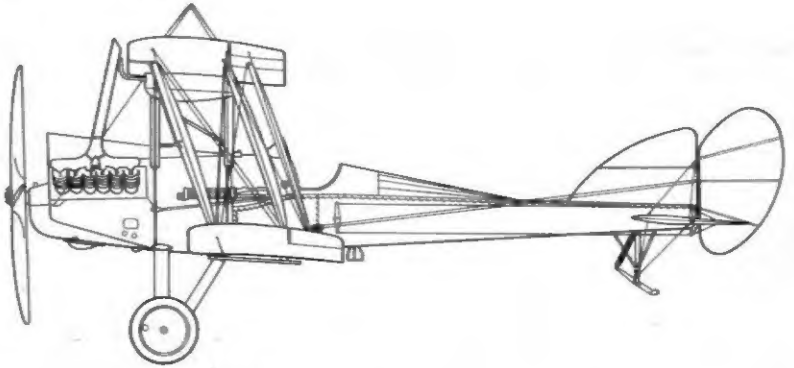
BE2c



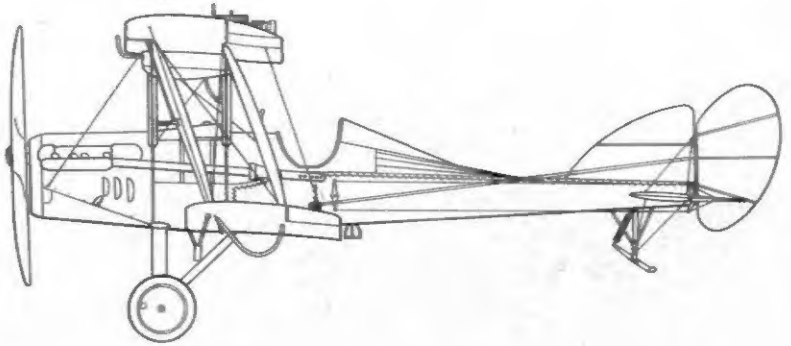
BE2d



BE2e/f/g



BE12a



BE12b

BE2a

The BE1 and BE2 had wings of equal span and this was one of the primary external difference in the first production variant, the BE2a. These aircraft were delivered with the upper and lower wings of unequal span (the upper wing being slightly longer). These aircraft also differed from the BE2 in having a revised fuel system which deleted the external fuel tank. The exhaust system was also changed with the pipes being extended further back under the fuselage. Additionally, a short decking was fitted to the fuselage immediately behind the engine. This decking afforded the passenger, who occupied the front cockpit, with some degree of protection.

Shortly after the first aircraft were delivered, the wings were changed to the equal-span type used on the original BE2. Aircraft that had been delivered during early 1913 with the shorter span lower wing were all retrofitted with the new wing.

When first introduced into service, Nos 2, 4 and 6 Squadrons were all scheduled to receive the BE2a. At the time all three units were based at Farnborough and on Salisbury Plain in the south of England. Later it was decided that No 2 Squadron should be moved to Montrose in Scotland. Five aircraft made the trip by air and among these were two BE2 aircraft. They successfully made the 250 mile trip in thirteen days, despite their rather unreliable engines. Various long-distance flights were subsequently carried out by No 2 Squadron which became somewhat specialized in this type of flying.

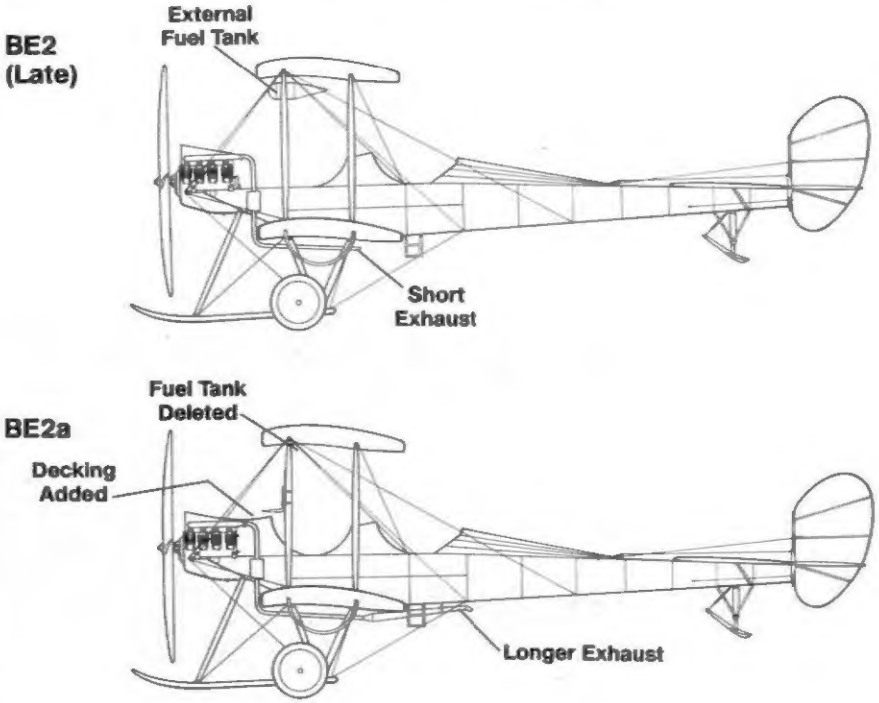
The BE2a was the subject of a number of experiments. One involved fitting an oleo type undercarriage and another saw the aircraft modified with interplane struts that had an increased chord at the top. These acted as small vertical stabilizers (or fins) since the BE2a had no fin/stabilizer forward of the rudder. Later, one BE2a at Farnborough was used in a series of experiments involving a pair of stabilizers (fins) mounted above the upper wing center section and a long span rectangular horizontal stabilizer.

Although the BE2b had evolved before the outbreak of war in 1914, BE2a aircraft were still used in significant numbers. A number of BE2a aircraft were among the Royal Flying Corps (RFC) types that crossed the English Channel to France in support of the British Expeditionary Force (BEF). It is believed that the first RFC aircraft to land in France was a BE2a (327) flown by CAPT F. F. ("Fanny") Waldron with Air Mechanic Skerritt in the front cockpit and not, as it has been reported, aircraft number 347.

A BE2a (217) on the grass field at York on 21 February 1913. The aircraft was taken on charge by the Royal Flying Corps some two weeks earlier and this display was probably during No 2 Squadron's visit to Montrose, Scotland.

LTs Wilfred-Smith and Osborne on final approach for landing in BE2a (206). The aircraft has been modified with an oleo type undercarriage for test work. The interplane struts were also modified with widened tops that acted like a vertical stabilizer.

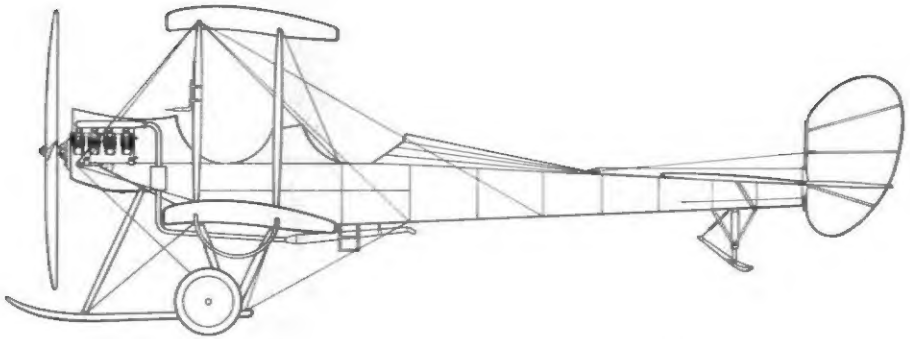
Fuselage Development

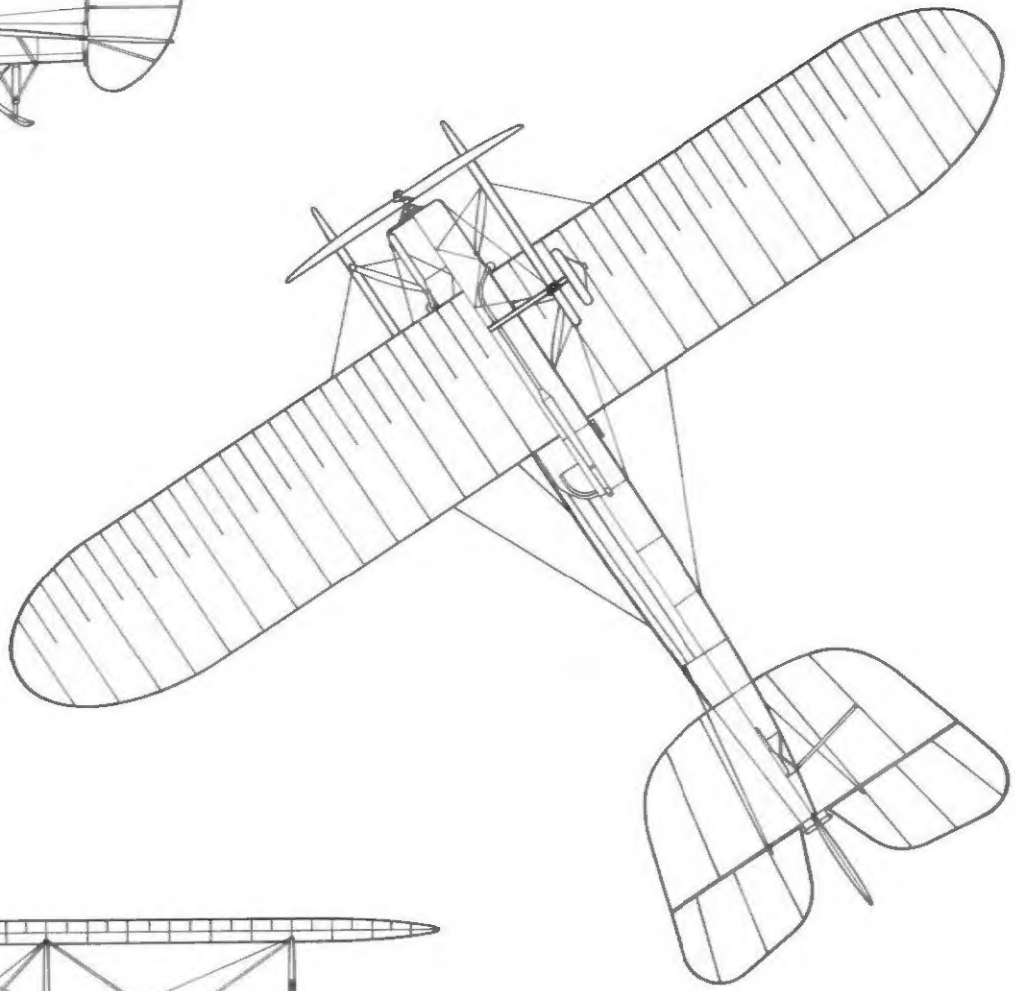


This BE2a (218) had an extra fuel tank in the faired over front cockpit. The aircraft made a flight to Ireland during September of 1913 with CAPT C.A.H. Longcroft at the controls. On 22 November 1913, the aircraft made a 430 mile flight from Montrose to Farnborough.

A BE2a (273) of No 2 Squadron, Royal Flying Corps at Castle Kennedy near Stranraer during late August of 1913. The aircraft participated in army maneuvers held in Ireland. This BE2a remained in service until 17 January 1914, when it was stricken off charge.

This BE2a was used for experimental work and was configured with an oleo type main landing gear and widened experimental "fin struts." Although these struts helped improve the aircraft's stability, they were not put into widespread use.





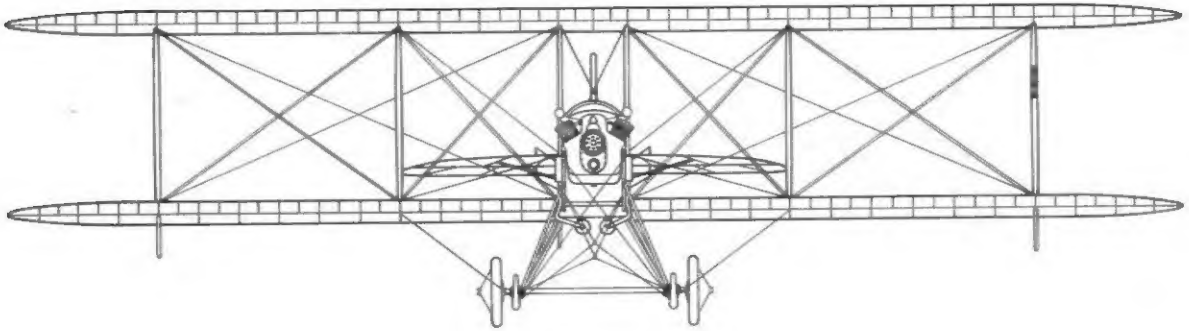
Specifications

Royal Aircraft Factory BE2a

Wingspan ..... 36 feet 11 inches
Length ..... 29 feet 6½ inches
Height ..... 10 feet 2 inches
Empty Weight ..... 1,100 pounds
Maximum Weight ..... 1,600 pounds
Powerplant ..... One 60 hp Renault liquid cooled engine

Armament ..... None

Performance
Maximum Speed ..... 70 mph
Service ceiling ..... 10,000 feet
Range ..... 210 miles
Crew ..... Two



BE2b

The next variant of the basic BE2 appeared during early 1914 and was designated the BE2b. These aircraft made up the bulk of the Royal Flying Corps (RFC) aircraft that went to France from Swingate Downs, Dover, after the declaration of war on Germany in August of 1914.

The BE2b differed little form the BE2a. The main external difference was a revised decking arrangement on the fuselage around the cockpits. Internally, the aircraft featured a revised control layout and a new fuel system.

The BE2b was historically significant in that it was flown by the winner of the first Victoria Cross awarded for an aerial action. On 26 September 1915, a BE2b (number 687) of No 2 Squadron, flown by 2LT William B. Rhodes Moorhouse, conducted a bombing mission against the railway outside the Courtrai station. Armed with a 112 pound bomb, he descended to 300 feet in order to make sure he scored a hit on the narrow railway. At this altitude the BE2b was an easy target for rifle fire both from the ground and a nearby church steeple. Additionally, the aircraft was struck by splinters from his own exploding bomb.

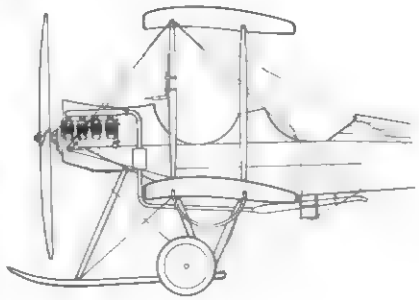
Severely wounded in the stomach, hand and thigh, Rhodes Moorhouse successfully flew for some forty minutes back to his base at Merville. He was lifted from the aircraft by 2nd Class Air Mechanic P.E. Butcher and other ground crewmen. His rigger and fitter later counted some ninety-five holes in the BE2b. After making his report, Rhodes Moorhouse was sent to the hospital where he died of his wounds the following day.

BE2b (650) carries the RFC markings in use during late 1914. These markings consisted of the Union Jack flag under the lower wings. There were no national markings on the rudder or above the upper wings.

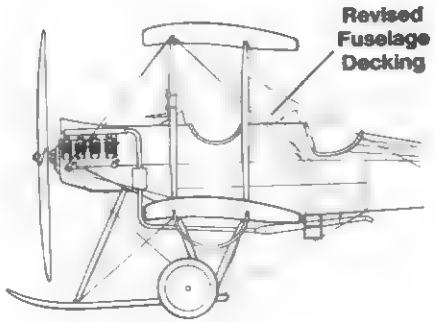
This BE2b (487) was forced down intact by German forces and set aside for technical examination. The national markings consisted of a Union Jack flag carried near the top of the rudder.

Fuselage Development

BE2a



BE2b



BE2c

The best known variant of the BE2 series and the one produced in greater numbers than any other, the BE2c introduced several new features to the basic design. Many of these changes were the direct result of experiments intended to produce a machine which was inherently extremely stable. Stability was thought to be a highly desirable characteristic, since the type was envisioned as a visual reconnaissance aircraft and camera platform.

The BE2c differed from the earlier variants in that it had a triangular vertical fin added ahead of the rudder (the fin was later increased in area and rounded at the top). The rounded horizontal stabilizer was replaced with a rectangular tailplane. While the first BE2c aircraft retained the undercarriage skids, these were quickly replaced with various types of oleo main landing gear.

The most important innovation was the use of staggered wings and the installation of true ailerons on both the upper and lower wings. The ailerons replaced the earlier wing-warping controls used on the BE2a and BE2b. One BE2c was fitted with a single pontoon type main float with a smaller float mounted under the tail and stabilizers under each outer wing panel.

Although never intended to carry weapons, the BE2c carried a variety of armament. Most two-seat aircraft carried a single Lewis machine gun for the observer in the front cockpit mounted on pipe type mounts designed by CAPT L. A. Strange. These mounts became known as "Strange mounts" and often aircraft were fitted with several different mounts in different locations. Another type of mounting, which resembled an old fashioned candlestick was also used, and these "candlestick" mounts were also installed in different locations on the fuselage. In this manner, the gun could be moved in flight between several mountings, depending on the direction of the threat.

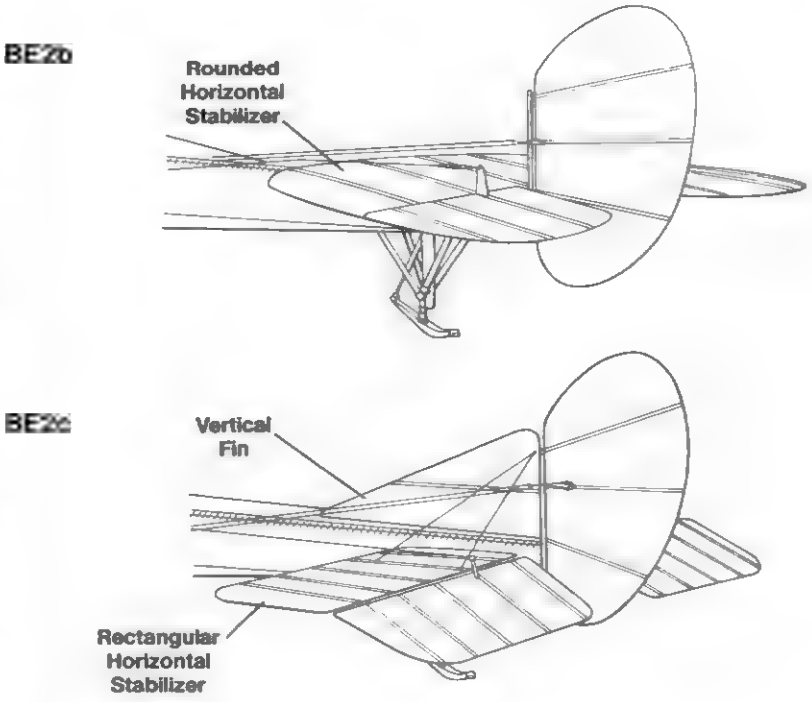
In addition to the two-seat BE2c, a single-seat version was introduced as a bombing platform. By fairing over the forward cockpit, a useful offensive load could be carried. For bombing, the basic stability of the BE2c proved an asset, but when the the aircraft was engaged by enemy interceptors, the lack of maneuverability quickly resulted in mounting losses. These losses caused the colorful member of parliament, Noel Pemberton Billing, to claim in the House of Commons that crews of Royal Aircraft Factory-designed machines had been "rather murdered than killed." This charge resulted in an official investigation led by Richard Burbidge, the General Manager and later Managing Director of Harrods, the well known Knightsbridge, London, store. The findings of this inquiry completely exonerated the BE2c, the aircraft which Billing had condemned.

Single seat BE2c aircraft usually carried a single fixed upward firing Lewis machine gun mounted ahead of the pilot, and at least one aircraft carried a Lewis machine gun mounted on the upper wing center section similar to the mounting on some Nieuport fighters. Bomb loads consisted of single or dual racks for 112 pound bombs under the wings, close to the fuselage. Normally, when carrying more than one bomb, the aircraft was flown solo. A number of BE2c aircraft were also configured with Le Prieur rockets for anti-Zeppelin missions. Normally, five rockets were mounted on each outboard interplane struts.

Various engines were fitted to the BE2c, the most common being the 90 hp RAF 1a. Other engines included the 105 hp RAF 1b and 1d, the 70 hp Renault, a number of Hispano-Suiza engines and the 90 hp Curtiss OX-5. The Curtiss engines were used to power some of the 300 BE2c aircraft delivered to the Royal Naval Air Service. These aircraft were used for bombing, anti-submarine patrol and training duties.

The BE2c prototype on the grass at Farnborough. The BE2c featured ailerons on both the upper and lower wings, a staggered wing arrangement, a triangular vertical fin and a rectangular horizontal stabilizer.

Tail Development



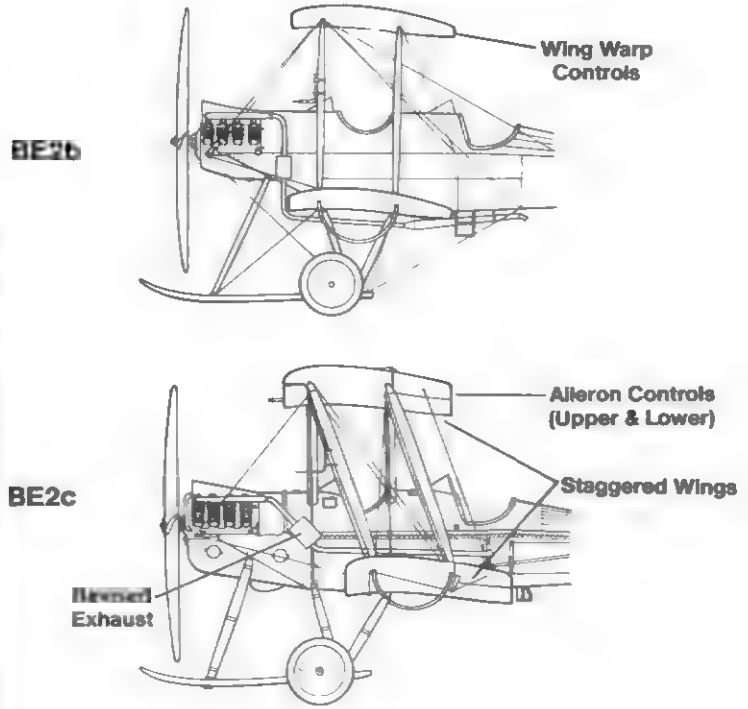
This BE2c operated with No 2 Wing, Royal Flying Corps during March of 1916. The BE2c featured equal span, staggered wings with aileron controls on both the top and bottom wings.

The RNAS was the first service to use the BE2c overseas. One mission was an attack against the Kuleli Burgas railway bridge across the Maritza River on 13 November 1915. This bridge was an important link on the Berlin to Constantinople railway and for gallantry displayed during his night attack, the pilot, Flight Commander J. R. W. Smyth-Pigott, was awarded the D.S.O. Another BE2c pilot was awarded the Victoria Cross for action in Palestine. On 20 March 1917, LT F. H. McNamara of No 67 Squadron (Australian) rescued CAPT D. W. Rutherford. He landed under fire to effect a pickup of the downed airman after Rutherford's aircraft had been forced down and Turkish troops were closing in.

At home, single-seat BE2c aircraft were flown by such distinguished pilots as W. L. Robinson, A. de B. Brandon and F. Sowrey. These men had been involved in the destruction of the German airships L11, L33 and L32. Robinson was awarded a Victoria Cross for his action and the others each received the DSO.

2029 was the last of a production batch of twenty-nine BE2c aircraft built by Armstrong Whitworth, one of the subcontractors involved in the BE2 program. The aircraft was later converted to a BE2e and was used for experimental work.

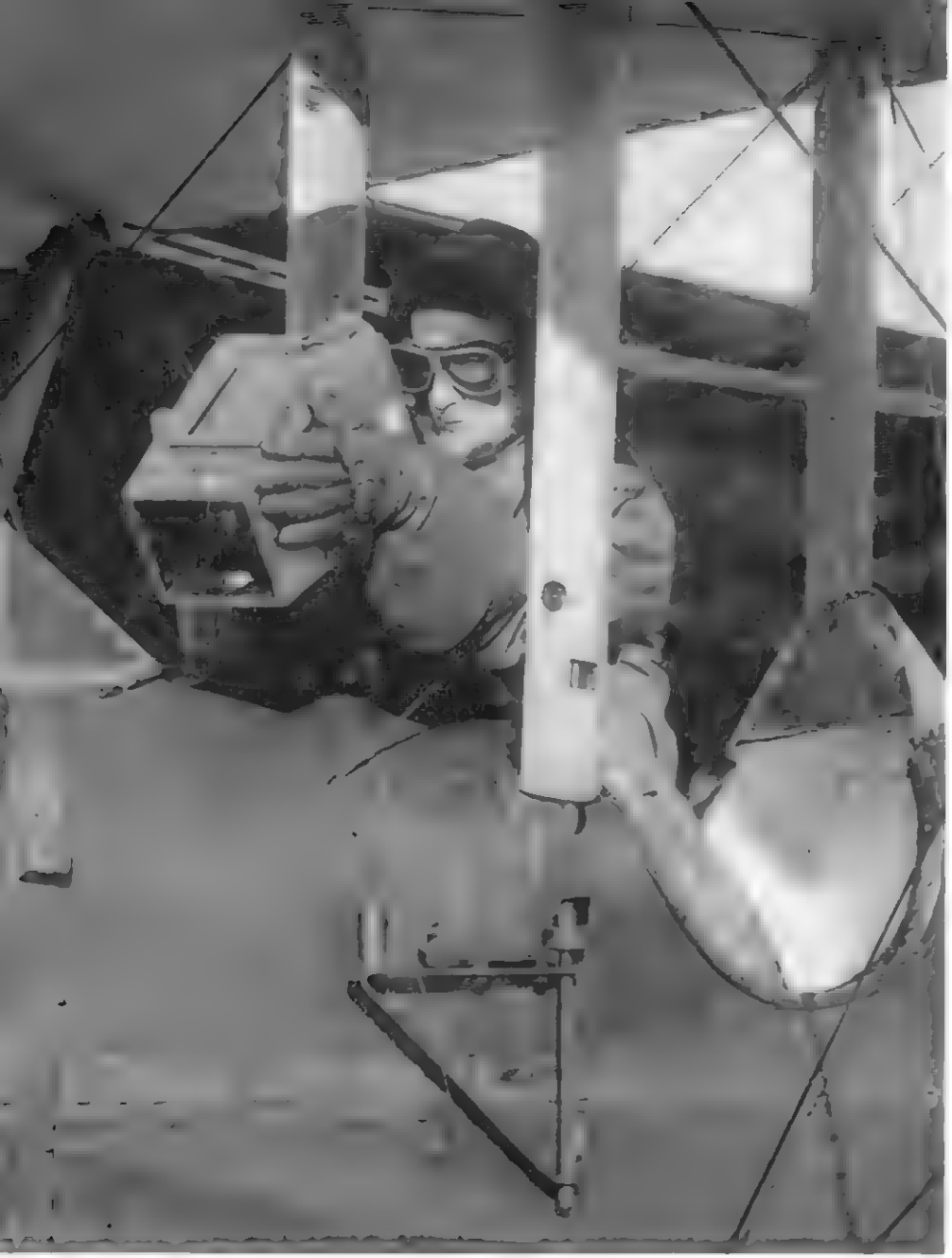
Wing Development



This BE2c (1768) was built by Vickers and featured a headrest for the pilot behind the rear cockpit. The circular object alongside the cockpit was a radio aerial reel. Vickers-built BE2s carried oversized fuselage roundels.

A BE2c of the Royal Naval Air Service fitted with a type 2d gravity fuel tank under the port upper wing. The aircraft was flown by Flight Sub-Lieutenant Pierce (observer) and Flight Commander Horniman (pilot).

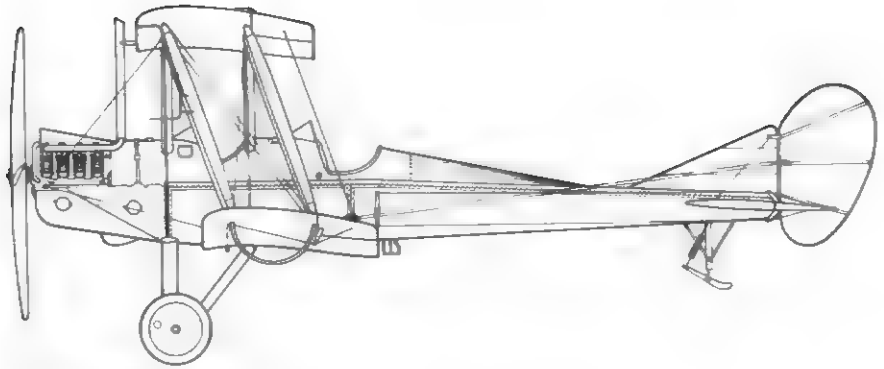
This RNAS BE2c was experimentally fitted with a C.A.V. car headlight on the lower starboard wing for use as a landing light. The trials were conducted at Whitley Bay during 1915.



For obtaining oblique reconnaissance photographs, the observer would hand hold the camera and turn around in the front cockpit. Normally the camera was mounted on wooden rails on the starboard side of the fuselage even with the rear cockpit.

A presentation aircraft, BE2c (1748), was purchased by the City of Liverpool. Later in its career the aircraft was attached to No 6 Squadron. The aircraft carries a small gravity tank on a center-section strut and an RFC roundel on the rudder.

This BE2c (4721) was outfitted as a floatplane with a single pontoon mounted under the fuselage and another under the tail. The aircraft was flown from Loch Doon in Scotland and had been built by Vickers at Crayford.



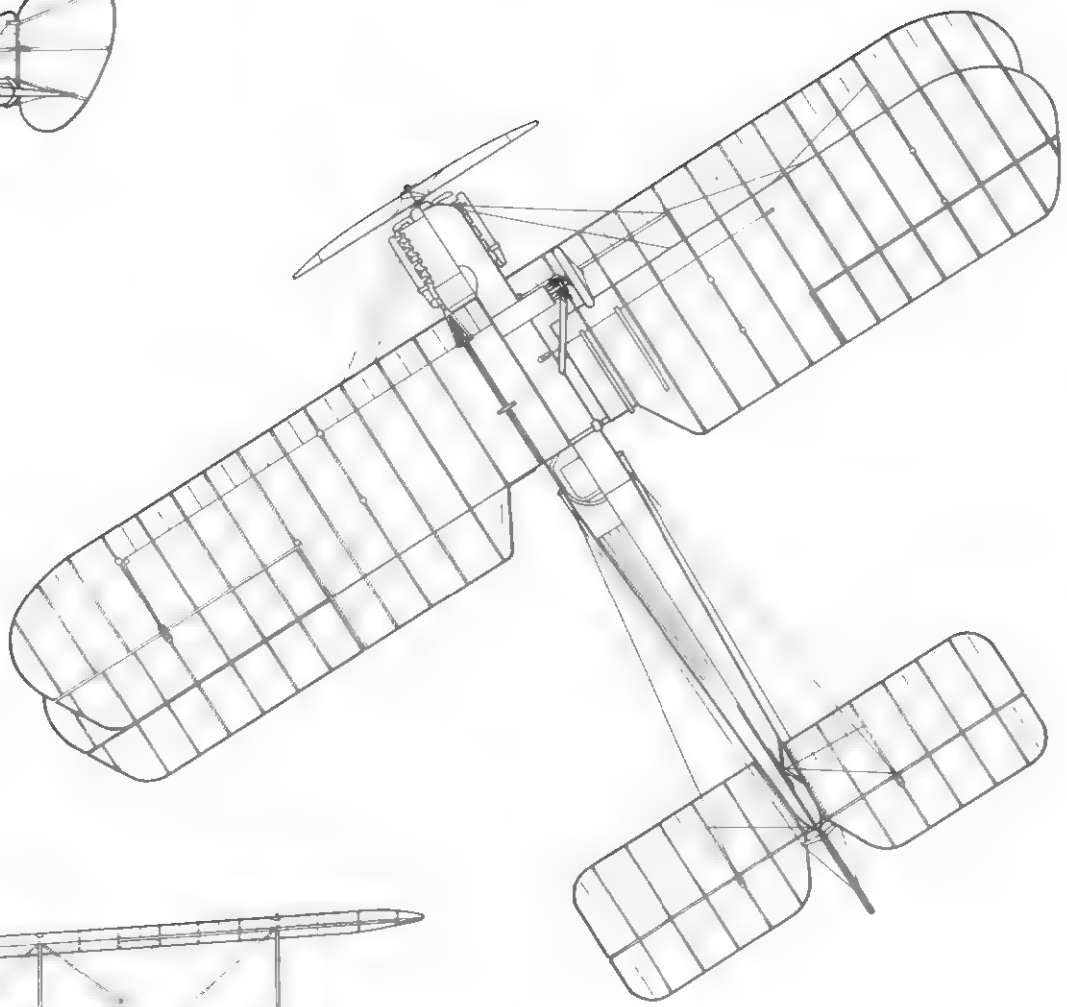
Specifications

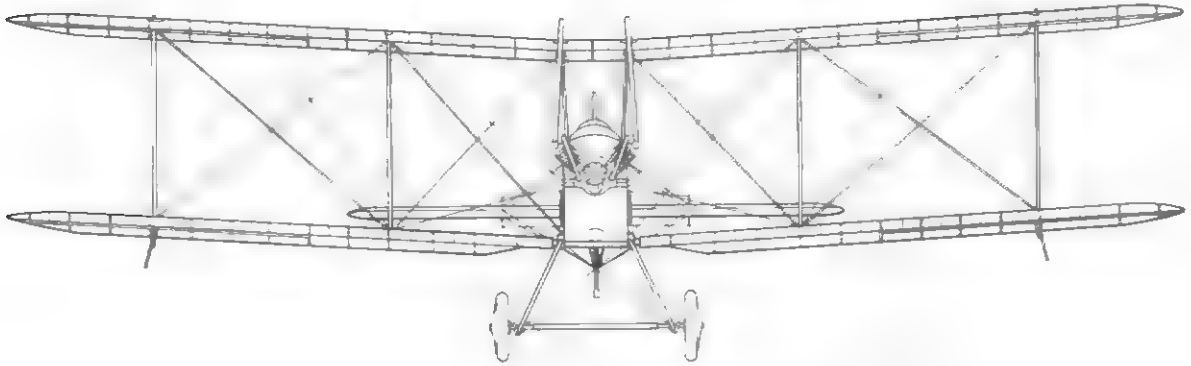
Royal Aircraft Factory BE2c

Wingspan ..... 36 feet 10 inches
Length ..... 27 feet 3 inches
Height ..... 11 feet 4 inches
Empty Weight ..... 1,370 pounds
Maximum Weight ..... 2,142 pounds
Powerplant ..... One 90 hp RAF 1a liquid cooled engine (other engines also used)

Armament ..... One to four Lewis .303 caliber machine guns and two 112 pound bombs (flown solo)

Performance
Maximum Speed ..... 72 mph
Service ceiling ..... 10,000 feet
Range ..... 270 miles
Crew ..... Two



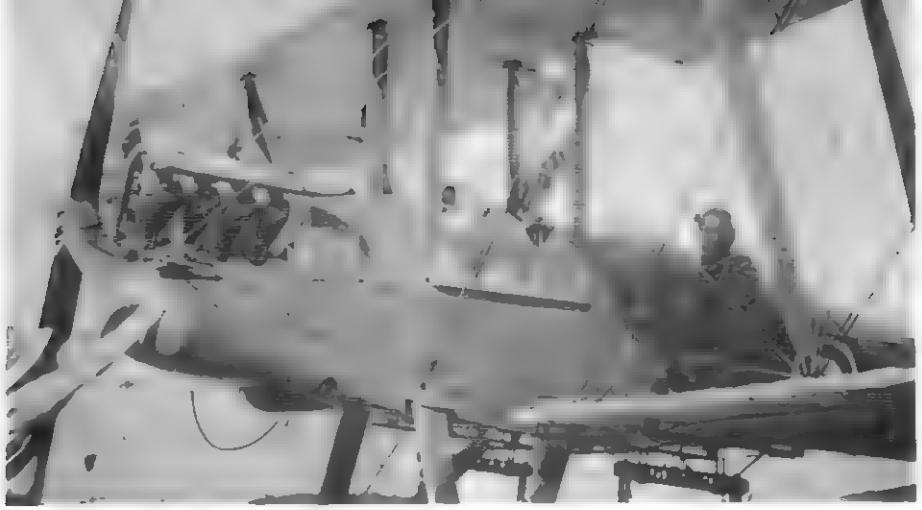


CAPT Winfield-Smith and his passenger, G. M. C Instone secretary of Daimlers, prepare to take off in a Daimlers-built BE2c, The aircraft was outfitted with a modified oleo-type undercarriage with a small front outrigger wheel.

The fuselage of a BE2c was modified to act as the gondola of an unidentified Sea Scout airship. Twenty BE2c aircraft were used, while thirteen other S.S. airships carried Maurice Farman fuselage gondolas.

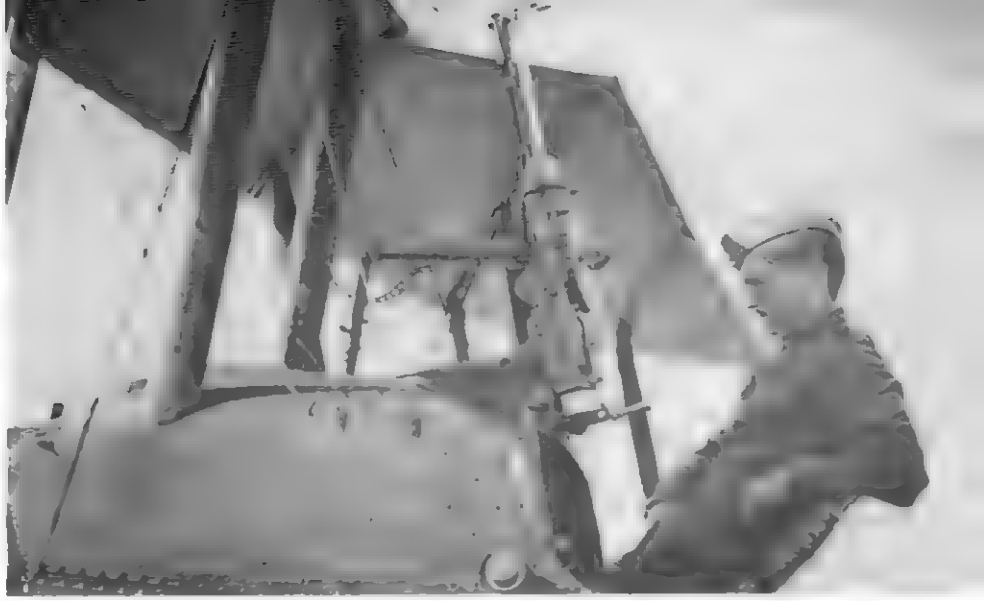
A number of S.S. (Sea Scout) non-rigid airships, such as S.S. 3, used a BE2c fuselage as a gondola The airship was sent abroad during 1915 and operated in the Mudros vicinity between 24 August and 3 September 1916. The airship was known as the "Silver Queen."

This BE2c (989) was experimentally suspended under an airship envelope. The idea was to carry the BE2c to altitude, then cast it off so that it could intercept German airships. A fatal crash at Chatham brought the tests to an abrupt end.



This BE2c carries a Lewis machine gun on a "Strange mount" behind the front cockpit. The rack on the fuselage side could carry three spare Lewis ammunition drums. The cable running down the fuselage side from the rear cockpit was the bomb release cable for the underwing bomb racks. These large racks were used to carry 112 pound bombs.

This BE2c (4395) of No 14 Squadron operated in the Western Desert against the Senussi. The aircraft carried a single Lewis machine gun and had bomb racks installed under the wings. The squadron later flew missions supporting the Grand Sheris of Mecca against the Turks.

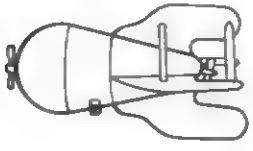


On 3 September 1916, LT W. L. Robinson shot down the German airship L11 flying BE2c (serial 2693). The Lewis machine gun was mounted on this BE2c to fire through the cutout in the upper wing. This type of gun mount was designed by CAPT L. A. Strange and was known as a "Strange mount."

This BE2c carried the presentation marking *Presented by the Indian Nobles* and is armed with two Lewis machine guns. One is mounted at the rear of the forward cockpit and the other is mounted on a "candlestick mount" on the starboard side of the cockpit.

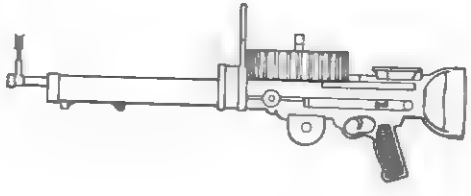
Weapons

112 Pound Bomb (Two)

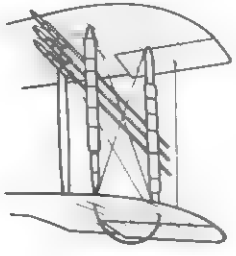


20 Pound (Up to Ten)

.303 Caliber Lewis Machine Gun



Le Prieur Rocket Installation Port Side



Le Prieur Rocket (Up to Ten Carried)

An observer/gunner demonstrates the use of a .303 caliber Lewis machine gun mounted on a "Strange mount" behind the front cockpit. There is a "candlestick" mount just behind the gunner allowing the gun to be used to firing forward.

This Belgian BE2c has a different engine and carries a Nieuport-type gun mount over the rear cockpit. The aircraft had the serial number 17 in Black on the center rudder stripe. The rudder striping was (front to rear), Black, Yellow and Red.

BE2c number 2671 was built by Ruston and delivered to Farnborough on 18 July 1915. The aircraft was assigned to No 10 Squadron on 31 August. Several aircraft from the Ruston production run were armored, others were delivered to the RNAS and a number were exported to Belgium.

This BE2c was powered by an American-built Curtiss OX-5 engine driving a two blade propeller instead of the normal four blade unit. The BE2 airframe could accept a wide variety of engines with little modification.

This wrecked BE2c had, what eyewitnesses termed, "a bad landing" at Mudros. The aircraft was completely destroyed. The fate of the crew is unknown.

This presentation BE2c (2757) was marked with the name of the donors, *SARAH*, on the forward fuselage in Black. The aircraft was assigned to the Royal Naval Air Service.

B3995 was a BE2c operated by No 18 Training School at Montrose. The aircraft had been assembled from spares by ground crews and it did not carry national markings on its upper wing. The aircraft was lowered from the building and repaired.

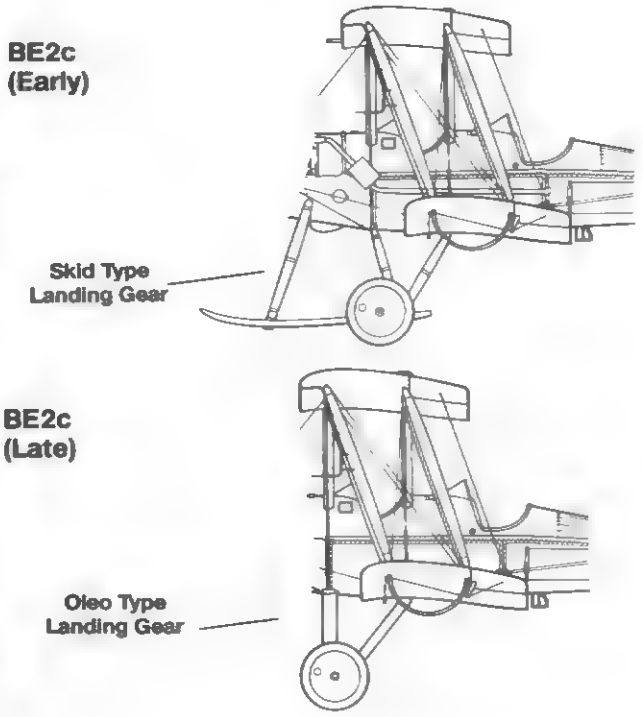
A BE2c (4306) of No 14 Squadron is serviced in the desert during the Sinai Campaign. The fuselage roundels are believed to be Red and Blue with the White replaced by the fuselage base color.

On the night of 12/13 August 1915, three BE2c aircraft were sent up from Yarmouth in an attempt to intercept four Zeppelins. All returned after dark with engine trouble and made heavy landings. This BE2c (992) was flown by Flight Lieutenant Vincent Nicholl.

A lineup of BE2c aircraft of No 13 Squadron, Royal Flying Corps about to depart from Gosport for France during October of 1915. In combat, the aircraft's lack of maneuverability would lead to high losses among BE2c squadrons.

The bomb rack under the fuselage on this BE2c is somewhat further back on the fuselage underside. The aircraft was one of a number of BE2c that were assigned to units operating in India.

Landing Gear



A Royal Naval Air Service (RNAS) BE2c is examined by a number of curious Mudros natives. The horizontal stabilizer and elevators were painted in Red, White and Blue stripes across their span.

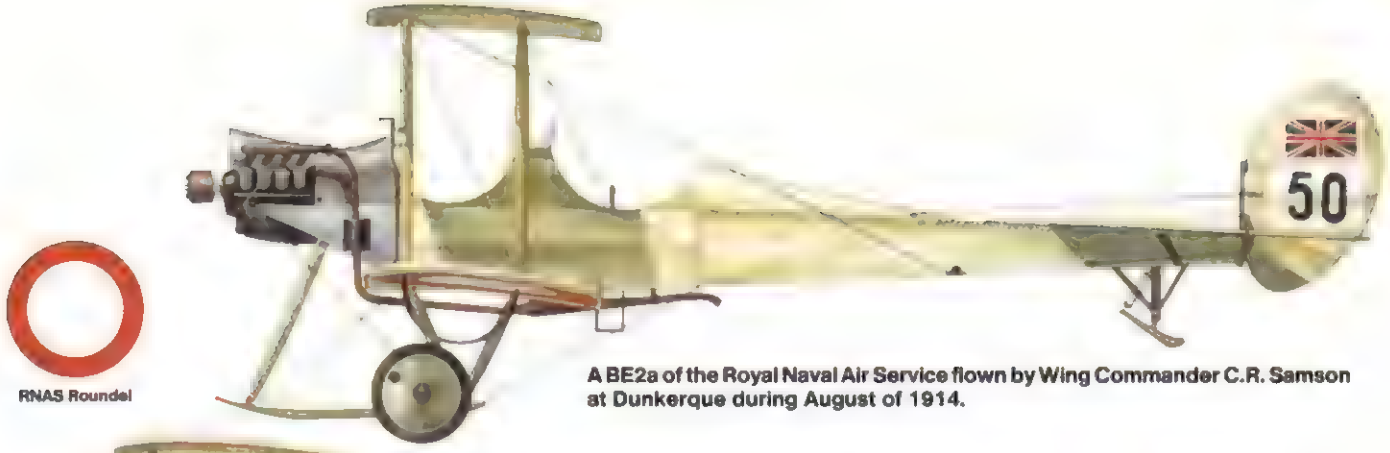
This BE2c was fitted with a bomb rack mounted between the undercarriage legs. The aircraft was flown by Lieutenant Stewart-Dawson of No 7 (Naval) Squadron at Dar-es-Salem in the Sinai.

BE2c (8496) was powered by a 90 hp RAF engine and was built by Beardmores, one of the BE2c subcontractors. The aircraft carries a Lewis machine gun on a "candlestick" mount beside the front cockpit.

A group of Beardmore officials pose with the first Beardmore-built BE2c, aircraft number 1099. The aircraft was powered by a 70 hp Renault engine and at least two of the production run of twenty-four aircraft were shipped to the Aegean for operations with the RNAS.

These BE2c aircraft on the grass at Great Yarmouth during April of 1916 were being prepared for a royal inspection by His Royal Highness, King George V.

This BE2c is outfitted with flare brackets under the wing tips for night flying. Aircraft 4894 was used for night interceptions of German raiders and was based at Dover. The aircraft is armed with a Lewis machine gun on a Strange mount in front of the rear cockpit.

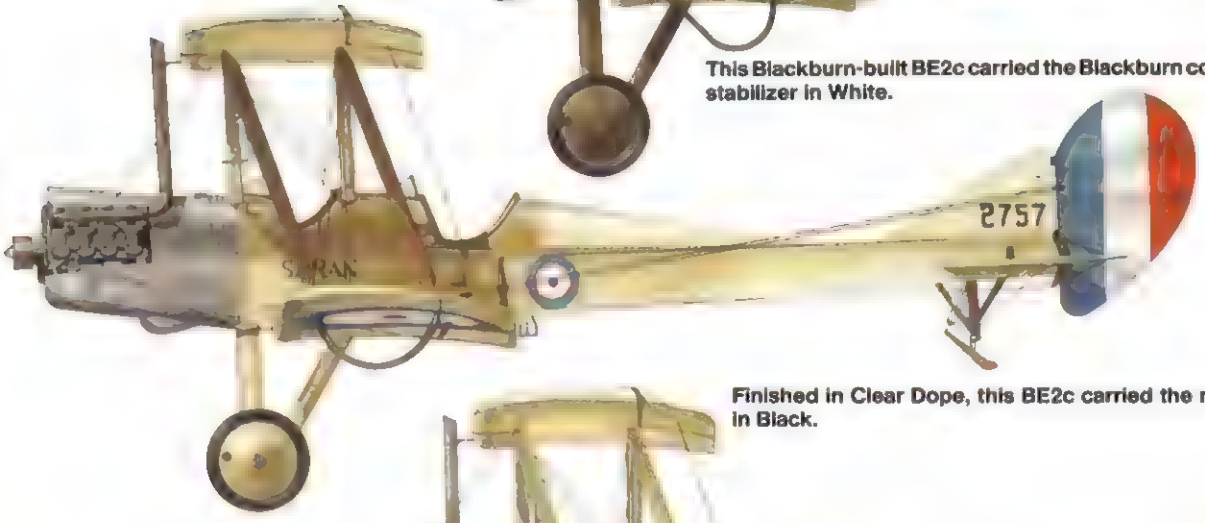


RNAS Roundel

A BE2a of the Royal Naval Air Service flown by Wing Commander C.R. Samson at Dunkerque during August of 1914.

This BE2b served as a training aircraft in the United Kingdom during 1915.

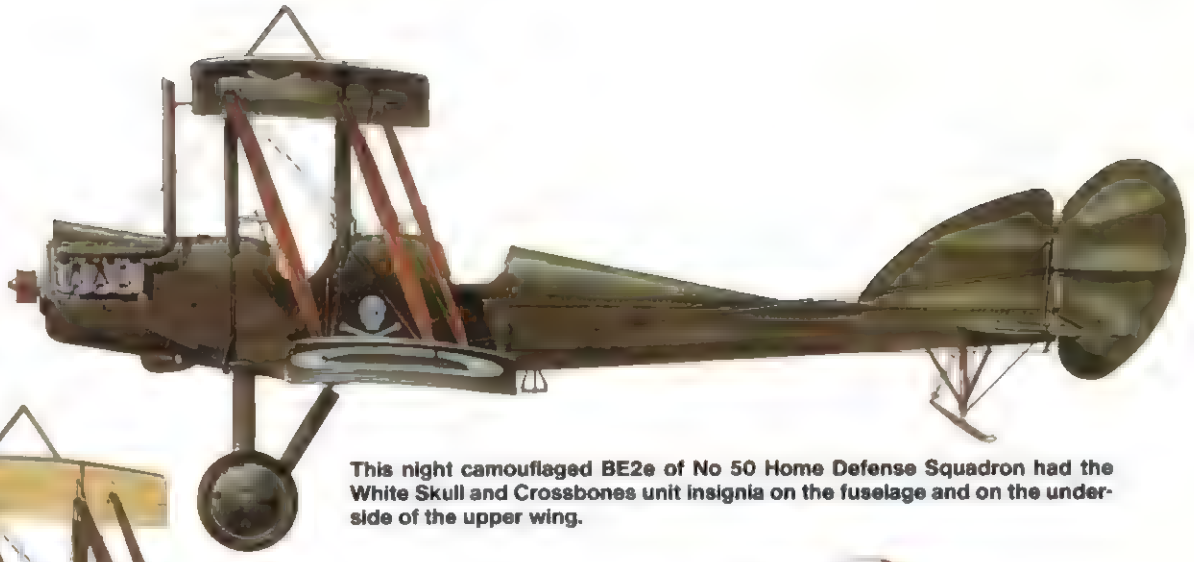
This Blackburn-built BE2c carried the Blackburn company logo on the vertical stabilizer in White.



Finished in Clear Dope, this BE2c carried the name *SARAN* on the fuselage in Black.

A BE2c of No 16 Squadron during 1916. The aircraft carried the inscription *St Catherines Ontario* on the fuselage and was declared missing on 1 June 1916.

50 HDS

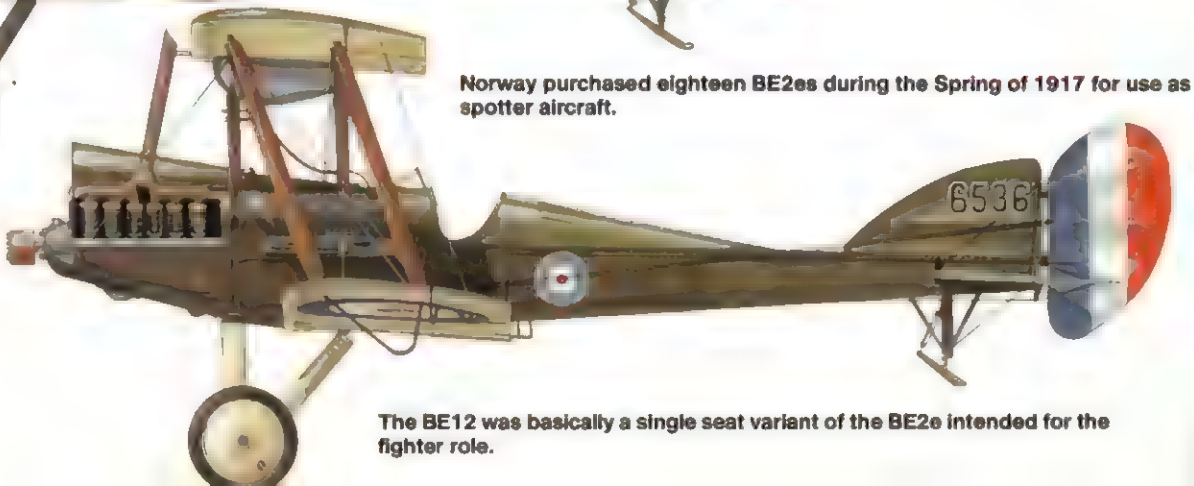


This night camouflaged BE2e of No 50 Home Defense Squadron had the White Skull and Crossbones unit insignia on the fuselage and on the underside of the upper wing.

A1350 was a BE2e used as a training aircraft at Waddington. The aircraft was used by both Nos 44 and 51 Training Squadrons and was wrecked on 6 January 1916.

This BE2e (serial A636) of the Armament Experimental Station was painted in an experimental camouflage during 1918.

Norway purchased eighteen BE2es during the Spring of 1917 for use as spotter aircraft.



The BE12 was basically a single seat variant of the BE2e intended for the fighter role.

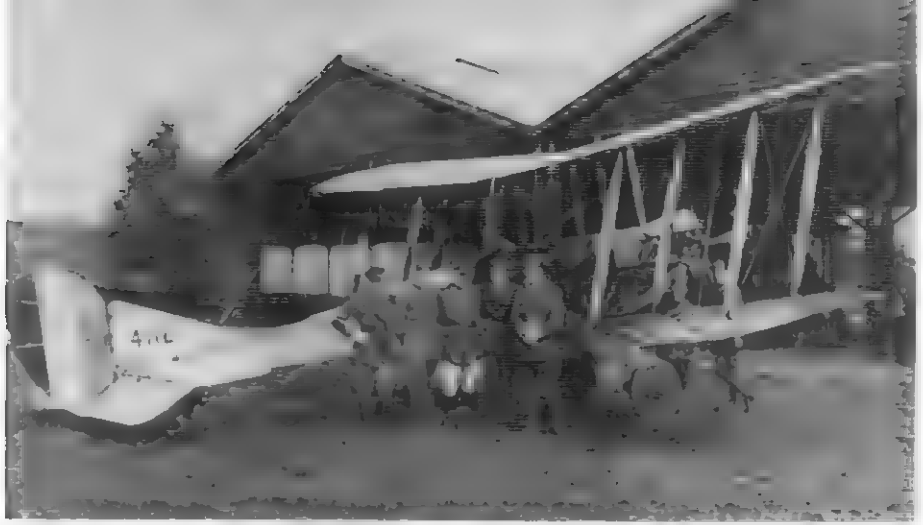
Aircraft number 1701 on the grass at Farnborough on 27 June 1915. The aircraft was assigned to No 4 Squadron on 30 June and remained with the unit until 19 November. It was finally struck off charge during March of 1916 with a total of 203 flying hours on the airframe.

BE2c aircraft undergo construction at the Beardmore works. The aircraft in the center, number 1115, is nearly complete and appears to have RNAS roundels. All Beardmore-built BE2c aircraft were powered by 70 hp Renault engines.

The first Beardmore-built BE2c (1099) carried Red and White roundels on the upper wing surface identifying it as a Royal Naval Air Service (RNAS) aircraft. These aircraft retained the early BE2c style skid type undercarriage.

This aircraft was procured for Canada by LTCOL Arthur Doughty and arrived in June of 1919 for display at the Canadian National Exhibition. The BE2c eventually was exhibited in Ottawa at the Canadian War Museum. The aircraft carried a BE2e type vertical fin.

This BE2c (long believed to be 4112) was given an overall Black scheme at the time of its "restoration" in Canada during 1965. It is now known to be a BE2c built by the British & Colonial aircraft company serial 5878, and not LT Sowrey's historic 4112, although it carries the propeller from 4112.

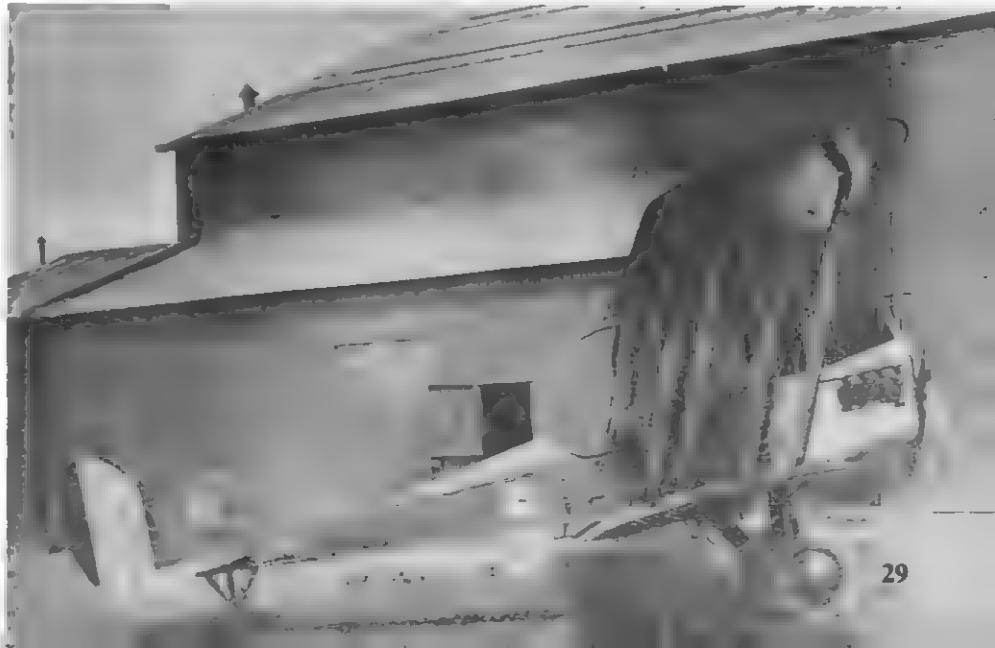


BE2c 4112 was used by Second Lieutenant F. Sowrey to destroy the German airship L32 during September of 1916. The victorious pilot (third from left) poses with his aircraft at Suttons Farm. The aircraft was armed with a single Lewis gun and had fittings for at least three Le Prieur rockets on the outer wing struts. The front cockpit was faired over.

A new production BE2c on the grass near the airship hangars at RNAS Howden on 8 September 1917. The aircraft is unarmed and lacks any sort of gun mount suggesting it was used as a training aircraft.

This BE2c (1688) has been modified with a BE2e style vertical fin, balanced rudder and oleo type undercarriage. The aircraft was tested at Farnborough and was powered by an RAF 1a engine.

The only British military aircraft to carry a five digit serial number was this Blackburn-built BE2c (serial 10000). The aircraft was modified at some point in its career with a a BE2e style vertical fin. The Blackburn logo was carried on the fin in White.



8293 was the first of a batch of twelve BE2c aircraft, fitted with 90 hp RAF engines, to be built by Grahame-White Aviation. The aircraft carries a bomb rack under the nose and several aircraft from this batch were specially fitted for night flying.

8293 carried the subcontractor's trademarks in the center of each interplane strut. The propeller carried the trademark of the Integral company on each blade. Other than the under nose bomb rack, the aircraft is unarmed and carries no gun mounts.

This BE2c (4119) carries an unidentified squadron marking to the rear of the fuselage roundel. The aircraft was damaged after a heavy landing. This BE2c was built by the British & Colonial Aircraft Company and was one of a production run of 150 aircraft.

Parked on the grass at Whitley Bay, this BE2c (1115) was undergoing testing and was flown by Rowland Dring on 21 August 1915. The aircraft was built by Beardmore and was powered by a Renault engine.

Ground crewmen prepare to pull the chocks from the wheels of this BE2c. The aircraft has the front cockpit faired over and the propeller carries a locally-made conical spinner. The aircraft has had the upper wing center section removed to improve the forward and upper view for the pilot.

This BE2c of No 12 Squadron was captured by the Germans and repainted with German insignia before being test flown. The aircraft was configured with bomb racks under the inboard wing panels and fuselage center section. 1744 was built by the British & Colonial company of Bristol.

A Beardmore-built BE2c (1116) on a test flight over Whitley Bay. The aircraft was flown by LT Nichol with Bert Hinkler acting as the observer/gunner. Hinkler later became an Avro test pilot and long-distance record-breaker. He had arrived in Great Britain from his native Australia during 1914.

This BE2c (8948) carries a vertical camera mounted on a wooden frame along side the rear cockpit. The aircraft was built from salvaged parts at No 18 Reserve School, Montrose. The instruction, *MONTROSE No. 8* on the fuselage indicates that there were others built in this [illegible].

BE2d

The BE2d differed externally from the BE2c in that it had a small external mounted gravity tank under the port upper wing. This tank was linked to an internal fuel tank that was housed in the fuselage to the rear of the pilot's cockpit (this tank was often removed in squadron service). The forward cockpit was modified in shape, with the sides being cut lower than on earlier variants.

Additionally, the BE2d featured dual controls and, although all were originally intended to have equal-span wings, most were modified either in service or during production to have a short span lower wing.

In the late Summer of 1915, production orders were placed with Vulcan, Ruston and Proctor, while The British and Colonial Aeroplane Company (later Bristol) was awarded a contract for two production batches. Not all of these machines were new construction: a number were conversions of earlier variants of the BE2.

Very few BE2d aircraft were to be flown against the enemy, the majority being utilized as trainers either in Britain or in France. A number of BE2d aircraft were later modified, either at the factory or at squadron level, with BE2e type wings and tailplanes. Normally, the BE2d was powered by a 90 hp RAF la engine, although a number were outfitted with other engines at various times during their careers.

For some unknown reason, the BE2d gained a reputation among pilots of being structurally frail, allegedly collapsing under the stress of violent maneuvers. This reputation remained with the aircraft despite the fact that there was never any proof of structural weakness.

This Ruston Proctor-built BE2d (6233), parked on the grass at Orfordness, is equipped with a Static Head Turn Indicator on the outer wing struts. Ruston Proctor built twenty-five BE2d aircraft before switching to the BE2e. The aircraft in the background are Sopwith F.1 Camels of No 44 Home Defense Squadron.

BE2e, BE2f and BE2g

The BE2e differed from the earlier variants in a number of ways. The aircraft featured unequal span wings with the lower wing being shorter. The short lower wing also led to a reduction in the number of interplane struts. While the BE2c had two sets of interplane struts, the BE2e had only one set of struts and a strut was installed connected to the upper and lower ailerons. Additionally, the vertical stabilizer was increased in size and the leading edge was changed from a straight leading edge to a curved leading edge. The shape of the horizontal stabilizer was changed with the squared off tips being replaced by angled tips which increased the effective area of the elevators. It was hoped that these changes would improve the aircraft's overall performance, although by the time the BE2e was introduced into squadron service, the Germans had introduced new fighters and the losses in BE2e squadrons remained heavy.

The BE2e was outfitted with dual controls so that it could be used as a trainer, but the aircraft's main role was that of a two-seat observation aircraft and photographic reconnaissance platform, with a secondary role of night and day bomber.

A further feature carried over from the earlier BE2d was the small gravity fed fuel tank mounted beneath the port upper wing, although like the BE2d, many of these were removed in squadron service. By removing the tank, the BE2e gained some 10 mph in top speed and the rate of climb was also improved. Its improved performance was the reason the BE2e was accepted for service, even though it retained the 90 hp RAF 1a engine used on most other BE2 variants. By retaining the engine, it was easier to modify older BE2c and BE2d aircraft to the new standard.

The BE2e remained in service long after it had become obsolescent and as a result, BE2e units suffered mounting casualties. The problem facing the Royal Flying Corps was that there was nothing suitable with which to replace them. By the time of the Armistice, however, most BE2e aircraft that remained in service were employed as trainers.

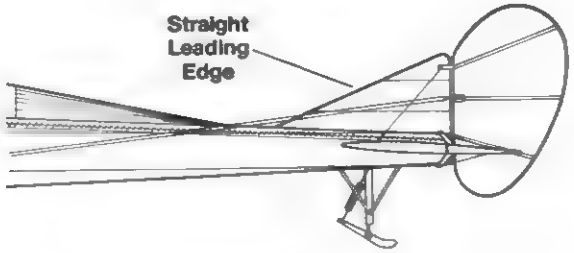
To meet the demands for more BE2e aircraft, the Royal Flying Corps (RFC) began modifying earlier BE2c and BE2d aircraft to BE2e standards. This proved to be more difficult than first thought and led to problems with the supply of spares, and maintenance of the hybrid aircraft soon presented serious problems. Internally, the modified aircraft retained some of the features of the earlier aircraft while externally they were identical to the BE2e. Some aircraft had dual controls while others did not, and the fuel systems and tankage differed between variants.

To clear up the supply and maintenance problems, an instruction was issued during early October of 1916 stating that modified BE2c aircraft would be redesignated as the BE2f, while rebuilt BE2d aircraft would be redesignated as the BE2g. Externally, the only way to tell them apart was by the aircraft serial number.

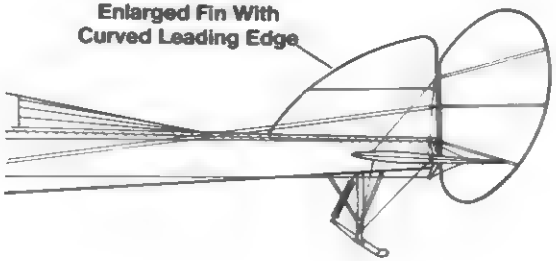
This factory fresh BE2e (4111) was built by the British & Colonial company of Bristol (later known as Bristol). The BE2e was the first variant to feature a strut connecting the ailerons.

Fin Development

BE2c

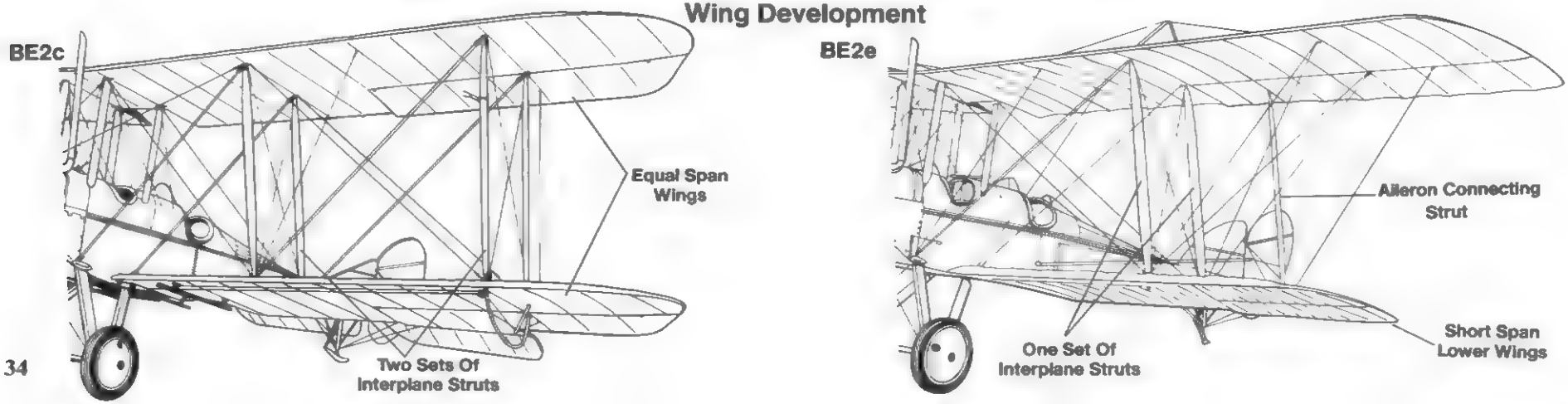


BE2e



The Wolsley Motors Factory in Birmingham also built BE2s, including this BE2e (A3075). It was a presentation aircraft and carried the legend *"Udaipur No. 4"* on the fuselage in White. The aircraft was assigned to No 26 Squadron in East Africa until retired in the Summer of 1918.

Wing Development



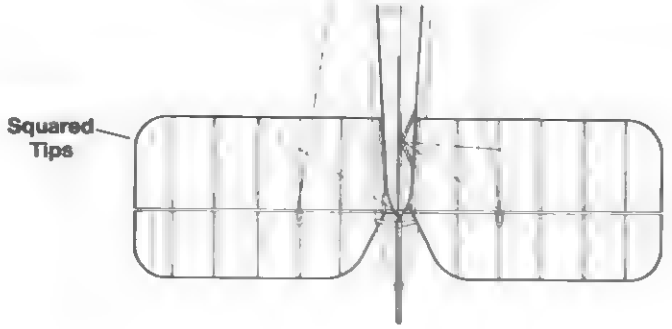
BE2e aircraft were also used by training units, and aircraft assigned to these duties were usually painted in White with a Red nose section. This aircraft carries a "candlestick" gun mount on the forward strut in front of the observer's cockpit.

This BE2e carried a dragon on the fuselage side and the name *'HOFOOK' HONG KONG* in White on the starboard side of the fuselage in front of the rear cockpit. C.6908 was used by the Wireless School, Biggin Hill, Kent.

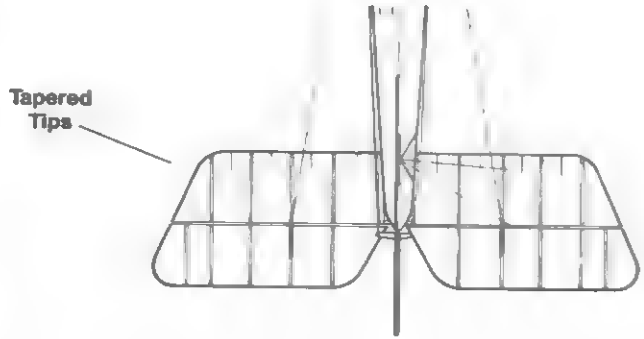
A BE2e takes off from Lydd at 1540 on 27 September 1917. The short span lower wing and single set of interplane struts are the primary identification features of the BE2e.

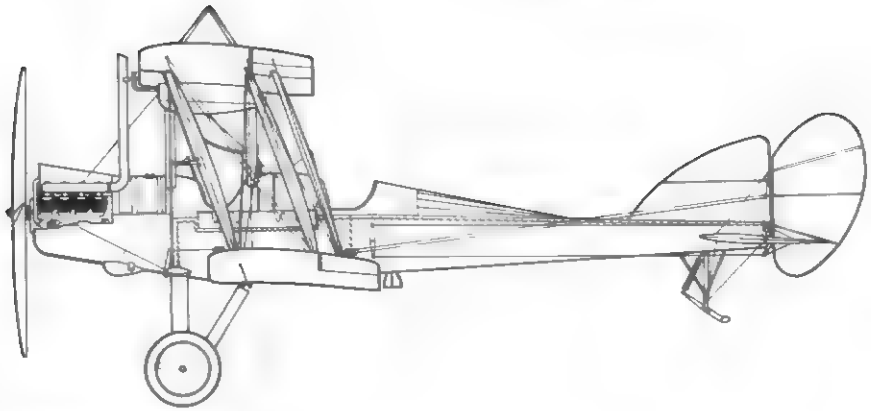
Horizontal Stabilizer

BE2c



BE2e





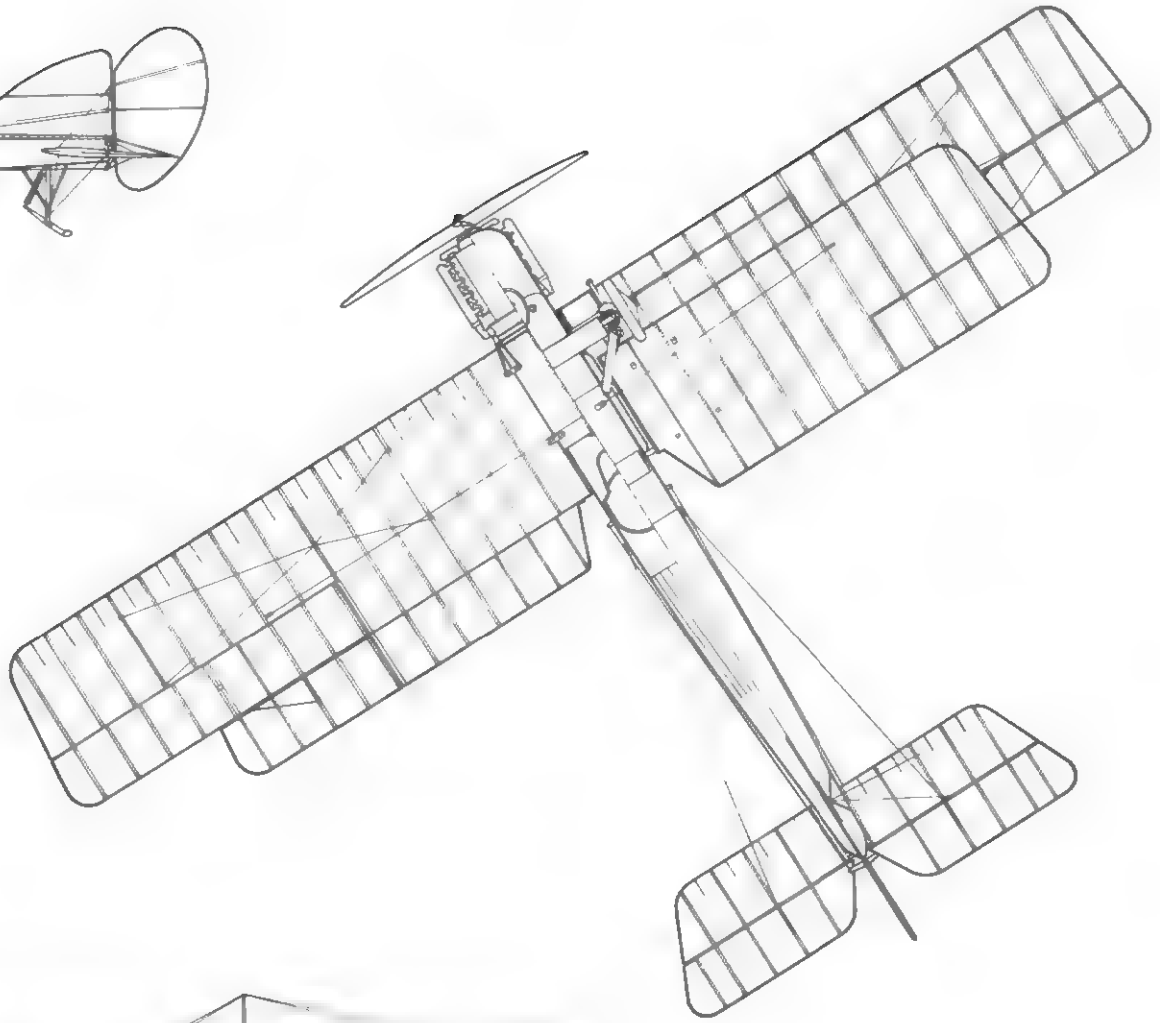
Specifications

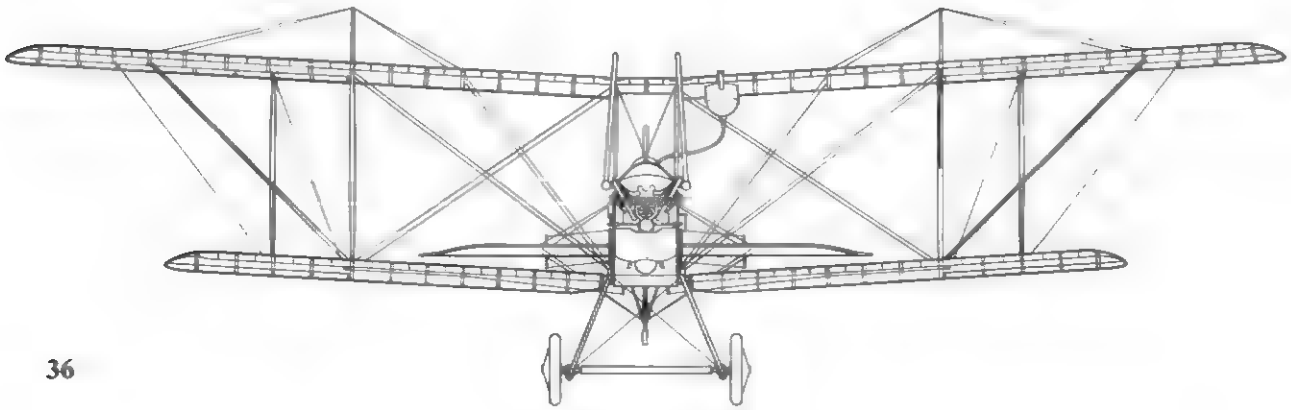
Royal Aircraft Factory BE2e

Wingspan ..... 40 feet 9 inches
Length ..... 27 feet 3 inches
Height ..... 12 feet
Empty Weight ..... 1,431 pounds
Maximum Weight ..... 2,100 pounds
Powerplant ..... One 90 hp RAF 1a liquid cooled engine (other engines also used)

Armament ..... Up to four .303 caliber Lewis machine guns, two 112 pound bombs, up to ten Le Prieur rockets

Performance
Maximum Speed ..... 90 mph
Service ceiling ..... 9,000 feet
Range ..... 360 miles
Crew ..... Two





This BE2e (6259) was built by Ruston Proctor and used by the Royal Naval Air Service for test work. The aircraft was equipped with a Rolls-Royce Hawk engine for one series of tests, and later a 150-hp Hispano engine was also tested in this airframe.

The Royal Norwegian Air Force also flew the BE2e. This RNAF BE2 is equipped with bomb racks under the wings, and has a ski landing gear replacing the conventional wheeled undercarriage for operations from snow covered airfields.

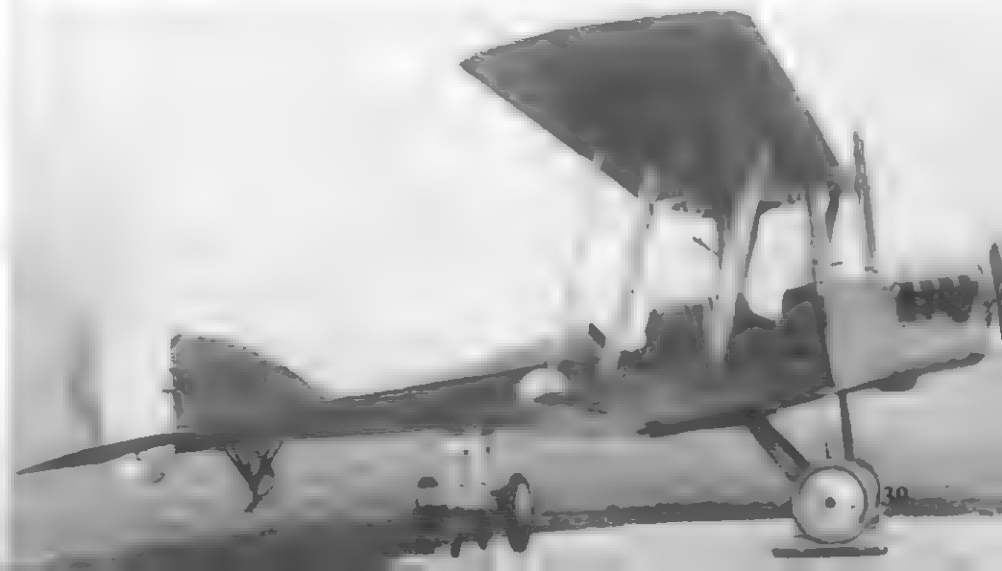
A BE2e shares the landing ground at Harling Road Station with an Avro 504K trainer. This BE2e was used for night training and was equipped with a blind flying hood over the front cockpit.

A pair of BE2e aircraft (A3084 and A1335) of No 17 Squadron on the grass in front of the hangar at Lahana. A1335 was built by Napier & Miller. The presentation of the serials on the aircraft are different: A3084 appears solid White, while A1335 is in White outline against the P.C. 10 background.

BE2e aircraft built by the British & Colonial Aeroplane Co. Ltd (Bristol) carried the Bristol trademark in mid-Green and Gold on the mid-point of the outer interplane strut surface.

This presentation BE2e carried the legend *Punjab 40 Lahore 3* on the fuselage in Black. A3060 was assigned to No 35 (Training) Squadron and was built by Wolsley Motors Company. It was still in service as of January 1919.

This BE2e (B4564) was the first of a production batch of 200 aircraft built by Bristol. The exhaust stacks are thinner than standard and the presentation of the serial number on the fin in Black was unusual.

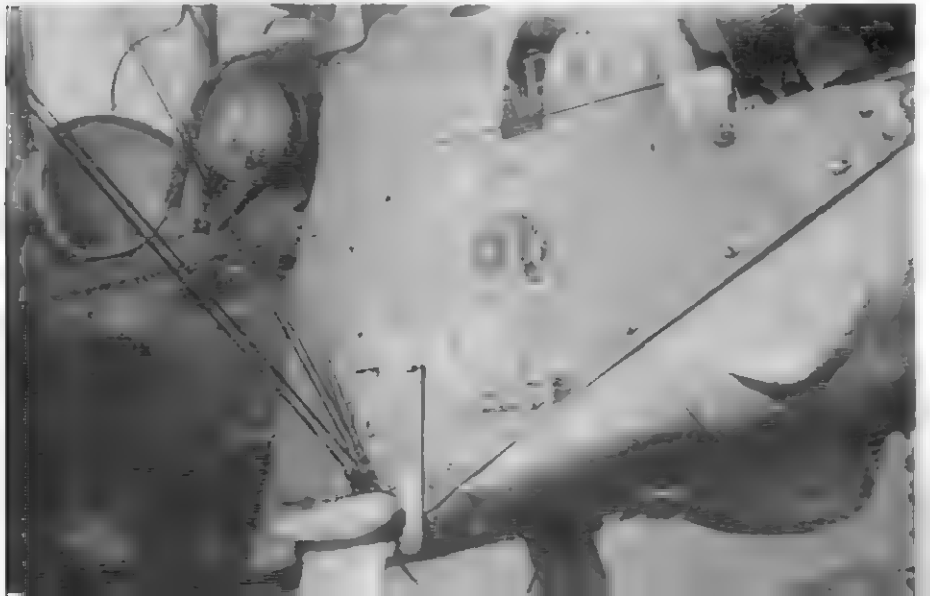


This BE2e (A1350), built by Napier and Miller Ltd, was destroyed in a crash on 6 January 1918 while assigned to No 51 Training School at Waddington. The fate of the crew is unknown.

A number of BE2e aircraft were converted from earlier production variants. 2029 was a BE2c aircraft converted to the BE2e configuration. Later, the designation of such aircraft was changed to BE2f.

This presentation BE2e carried the legend *'Trinadad and Tobago' Aeroplane* on the fuselage in White. The aircraft served with No 31 Squadron in India during July of 1916.

BE2 aircraft often carried nose art such as this BE2e with Charlie Chaplin on the nose. The drum in front of the cockpit is for a trailing radio antenna.



A camera gun is suspended under the upper wing center section of this BE2e (B4518). The aircraft was assigned to No 75 Squadron and was used for Home Defense duties.

The significance of the Maltese Cross marking on the rudder of this BE2e on the landing ground at Aboukir is unknown. The aircraft is unusual in that it does not appear to carry a serial number.

This BE2e was converted to the single-seat configuration and used for night interception of German raiders. A1855 was attached to No 100 Squadron during early 1917.

BE12

The BE12 was basically a re-engined BE2c airframe. The original 90 hp Royal Aircraft Factory 1a water cooled engine was replaced by a more powerful 150 hp Royal Aircraft Factory (RAF) 4a water cooled engine. The 150 hp RAF 4a engine, while developing increased horsepower, used many components which were already in use on other power plants. Besides the engine, the aircraft differed from the BE2c in that the front cockpit was faired over and the space used for additional fuel. The early BE12 had the Be2c type vertical fin and equal span wings.

With its increased performance, the BE12 was ordered into quantity production toward the end of 1915. Initially, the aircraft was intended to serve as a bomber and not as the single-seat defensive aircraft that it eventually became. One early BE12 was sent to France for an operational evaluation during the Spring of 1916, equipped with a single forward firing .303 caliber Lewis machine gun mounted on the port fuselage side just forward of the cockpit. This gun was tested in both synchronized and unsynchronized (with propeller deflector plates) form.

The Lewis gun received unfavorable reports, since it was quickly discovered that the interrupter gear could not be relied upon to function properly with the engine throttled back. Throttling back the engine was necessary in a diving attack since it was found that the force needed to successfully recover from a dive with the throttle full open was beyond the physical strength of the average pilot. As a result, the BE12 was used mainly for Home Defense duties.

The aircraft's stability was an asset for night interception duties. Once the Vickers mechanical interrupter gear became available, the standard forward firing armament of the BE12 was changed to a single .303 caliber Vickers machine gun mounted on the port side of the fuselage with the ammunition bin located inside the fuselage. Secondary armament consisted of a Lewis machine gun carried on a flexible "Strange mount" (locations varied).

To meet the needs of the Home Defense squadrons, a variant with slightly superior performance was evolved by fitting a BE12 with the wings and tail unit from the BE2e. This variant received the designation BE12a. The majority of these aircraft were used by units assigned to the Middle East. No 67 Squadron (Australian) had at least five aircraft during 1918 and these were used as escorts for RE8s and for aerial reconnaissance and night bombing.

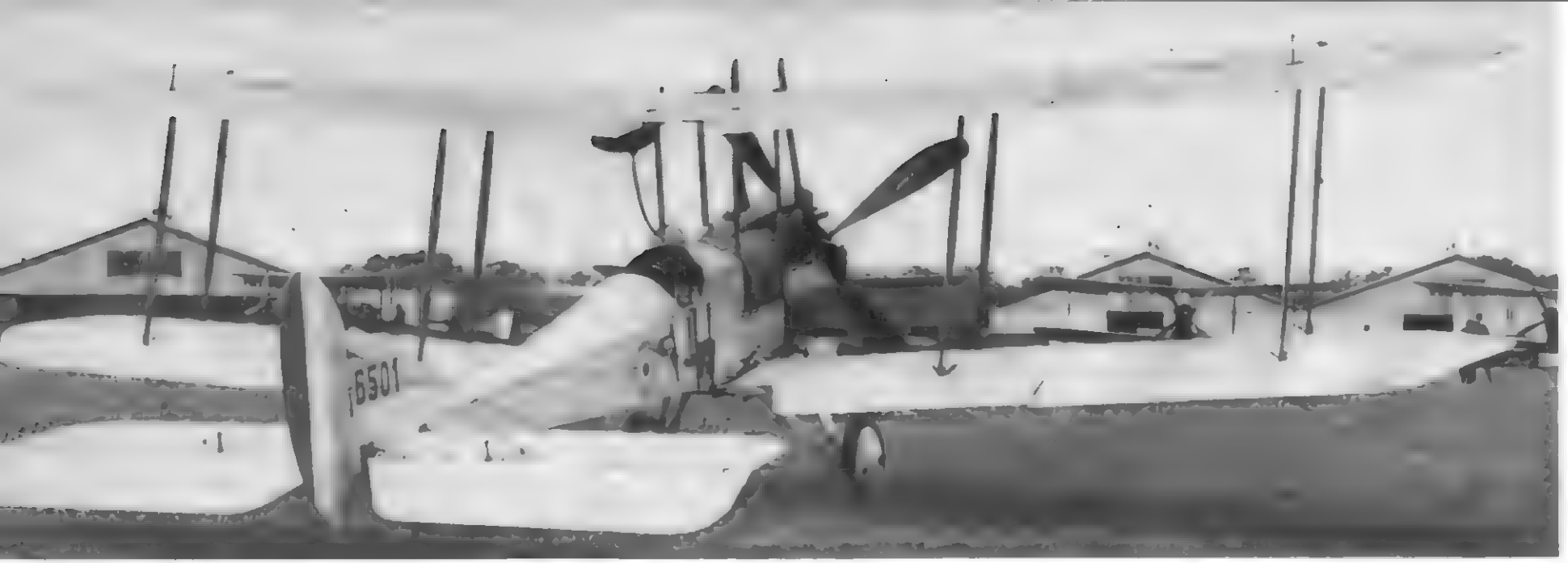
The BE12a was followed into service by the BE12b, a variant intended exclusively for night interception of German Gotha bombers that were being used as night raiders. This variant of the BE12 was usually more heavily armed, carrying single, twin or even four Lewis guns on various combinations of "Strange" mountings. One of the most common configurations was a single Lewis gun on an overwing mount. Another was twin Lewis guns on a swiveling gun mount attached to the struts in front of the cockpit. This mount was capable of being reloaded in flight and some of the guns were equipped with illuminated night sights. Other BE12s were fitted with Le Prieur rockets on the outboard interplane struts. The number of rockets varied with some aircraft being configured with three rockets, while others carried five rockets on each wing. These weapons were found to be rather impractical and most kills were made with guns rather than the rockets. The BE12b was also fitted with flare brackets under the lower wing tip and a number of aircraft also carried flare brackets under the rear fuselage. As with the earlier BE2 series, BE12 aircraft were fitted with bomb racks under the inboard lower wing and under the forward fuselage, and most were equipped with a fixed camera mount on the starboard fuselage alongside the cockpit for holding an aerial reconnaissance camera.

The BE12b was equipped with a 200 hp Hispano-Suiza engine (the same engine as the SE5a) driving a two blade propeller. The engine was housed in a cowling strongly reassembling that of an SE5a and the exhaust pipes ran along both sides of the fuselage. The modification improved the climb performance of the aging BE so it could reach the operational altitudes of raiding enemy airships and the large German bombers. At least thirty-six BE12b aircraft were allocated to Home Defense squadrons during 1917 and 1918.

BE12 and 12a aircraft were initially intended for use on the Western Front and the aircraft was issued to Nos 19 and 21 Squadrons. Like the earlier BE series aircraft, it was a complete failure as a day fighter due to its inherent stability and lack of maneuverability. As a result, GEN Trenchard, commander of the Royal Flying Corps, ordered the aircraft withdrawn from the fighter role and they were shifted over to the bombing role on both the Western Front and in the Middle East. Normal load for aircraft operating in this role was two 112 pound bombs (one under each wing) or eight to twelve twenty pound bombs.

Other BE12s were pressed into service as trainers and still others were utilized for experimental purposes. One aircraft was outfitted with a six-pounder Davis recoilless gun mounted on the starboard fuselage side and angled to fire upward. The gun could be rotated down for reloading and was intended for anti-airship use. In the event, the weapon proved cumbersome to operate and the idea was abandoned.

1697 was originally a BE2c that was re-engined with a 150 hp RAF 4a engine to become the BE12 prototype. Later, the aircraft was fitted with an enlarged fin and sent to France for evaluation.

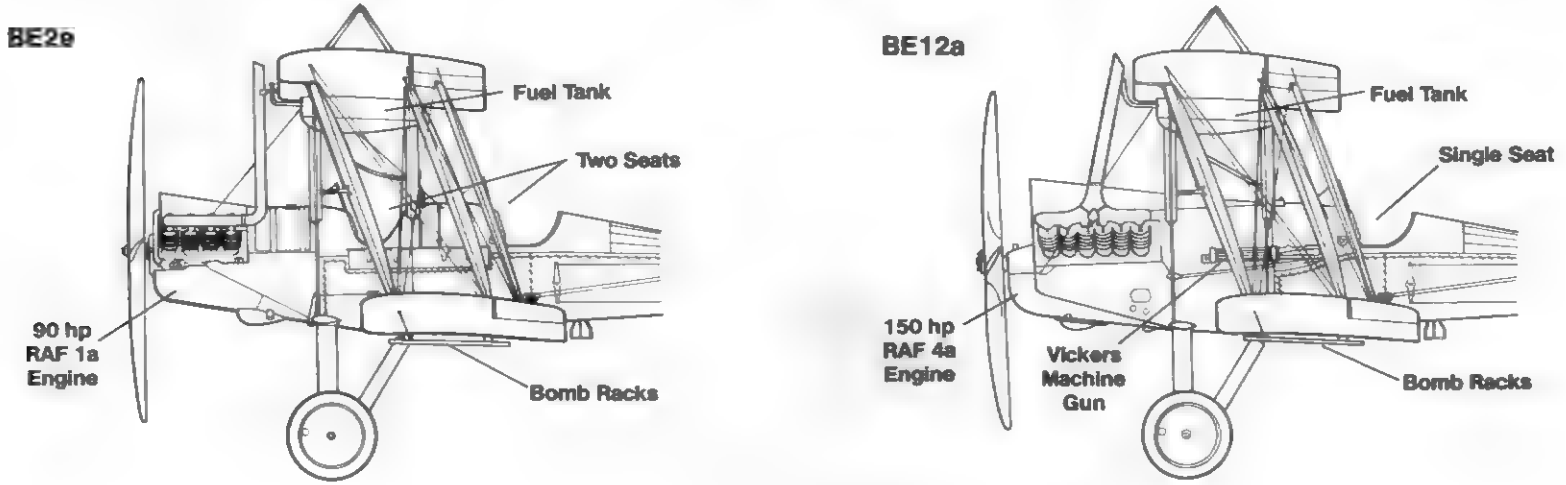


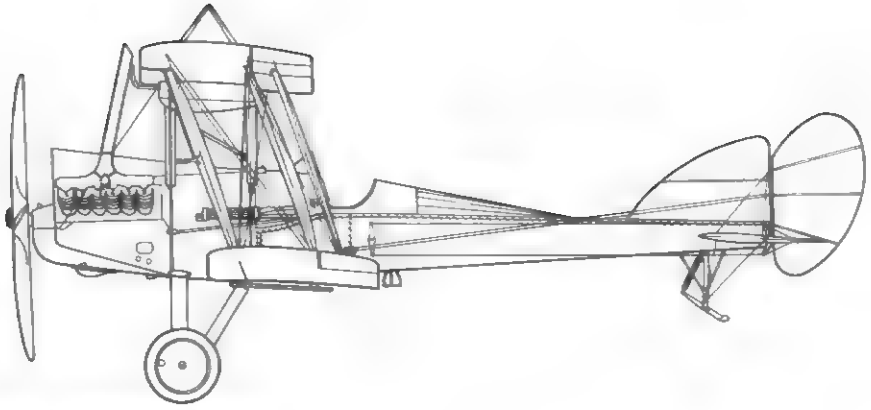
This early production BE12 was built by Damiler and carries a BE2c style small fin. This aircraft later served with No 47 Squadron and No 39 Squadron. The aircraft finished its career with the Central Flying School, arriving there during July of 1916.

The BE12a had the wings and tail surfaces of the BE2e in place of the earlier BE2c style wings and tail. The BE12a was built in larger numbers than any other BE type aircraft and was built by a number of subcontractors, including Damiler.

This Coventry Ordnance Works-built BE12a (A'597) has navigation lamps above the lower wing tips mounted close to the wing leading edge. The aircraft is configured with a single 112 pound bomb under the fuselage.

Fuselage Development





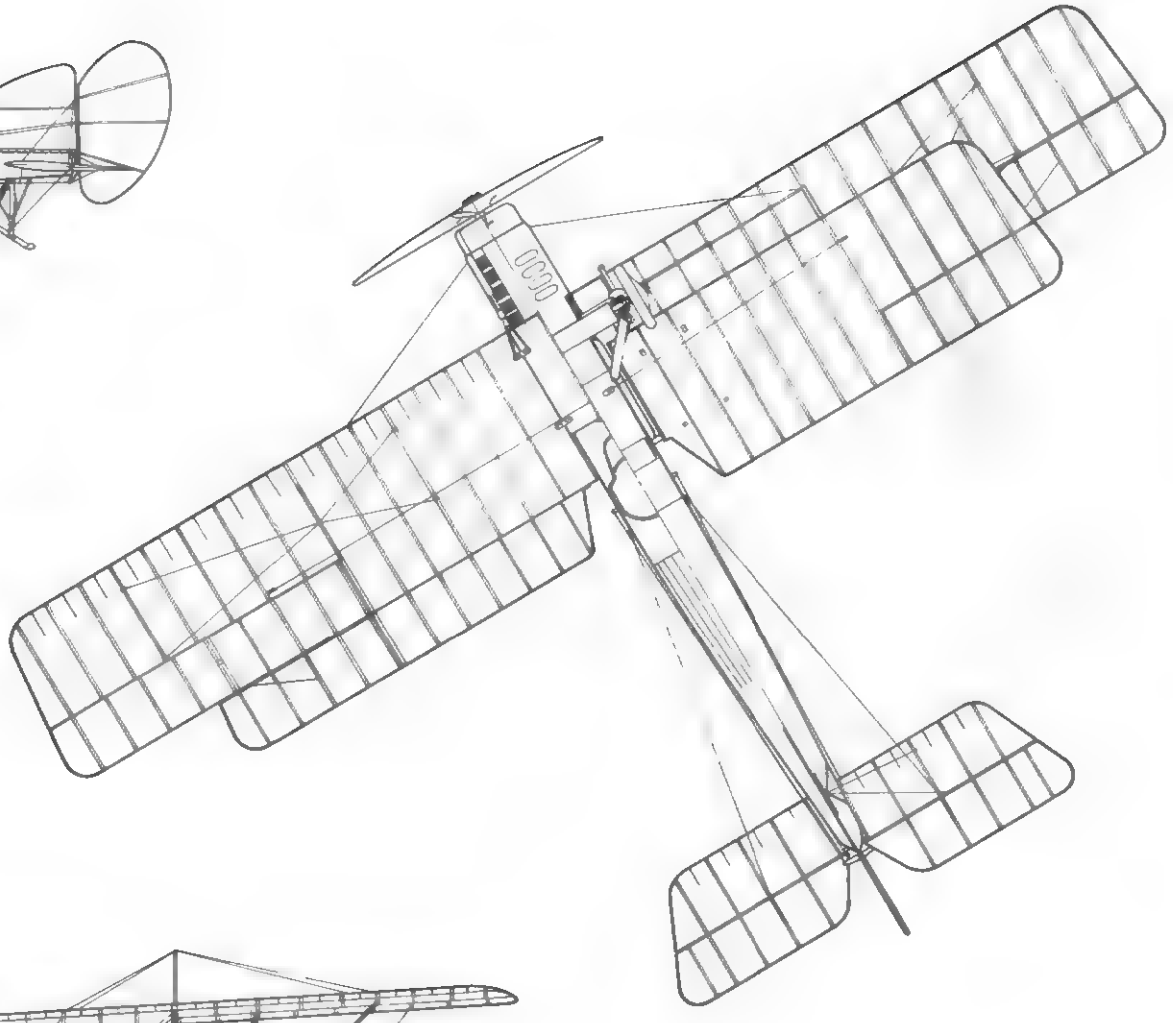
Specifications

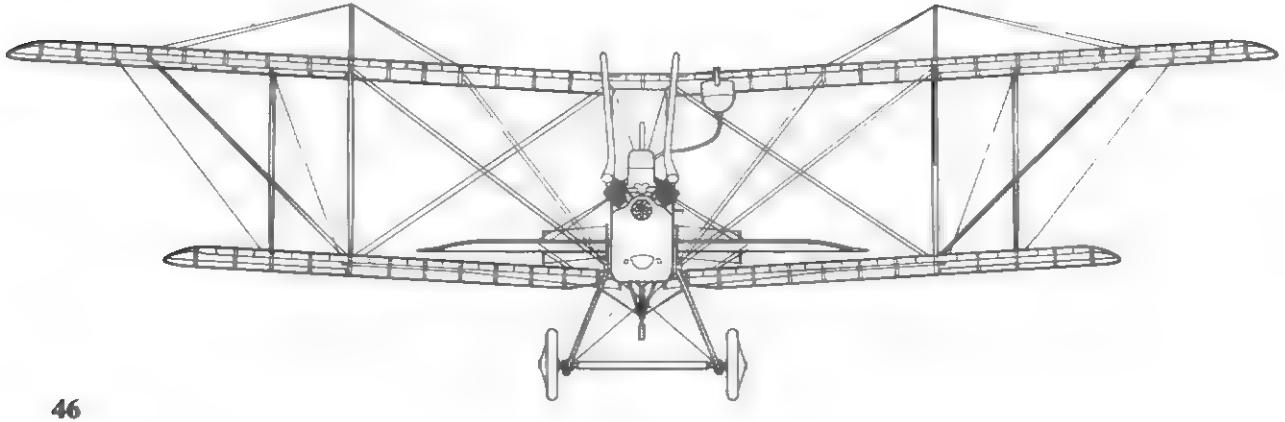
Royal Aircraft Factory BE12a

Wingspan ..... 40 feet 9 inches
Length ..... 27 feet 3 inches
Height 12 feet
Empty Weight ..... 1,610 pounds
Maximum Weight 2,327 pounds
Powerplant ..... One 150 hp RAF 4a liquid cooled engine

Armament ..... One .303 Vickers machine gun and one .303 Lewis machine gun, two 112 pound bombs, up to ten Le Prieur rockets.

Performance
Maximum Speed ..... 105 mph
Service ceiling ..... 11,000 feet
Range ..... 315 miles
Crew ..... One

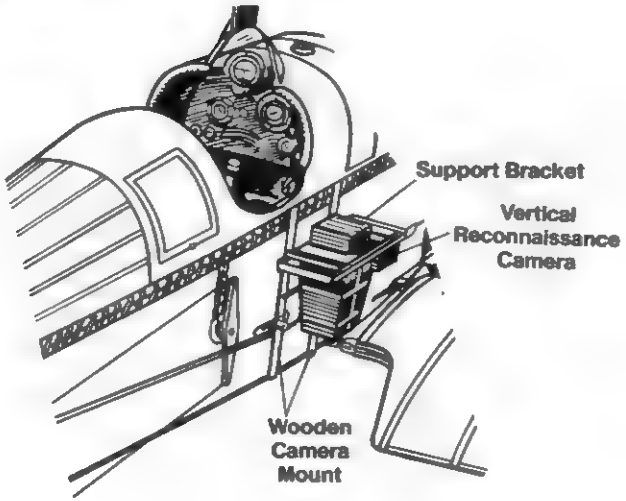




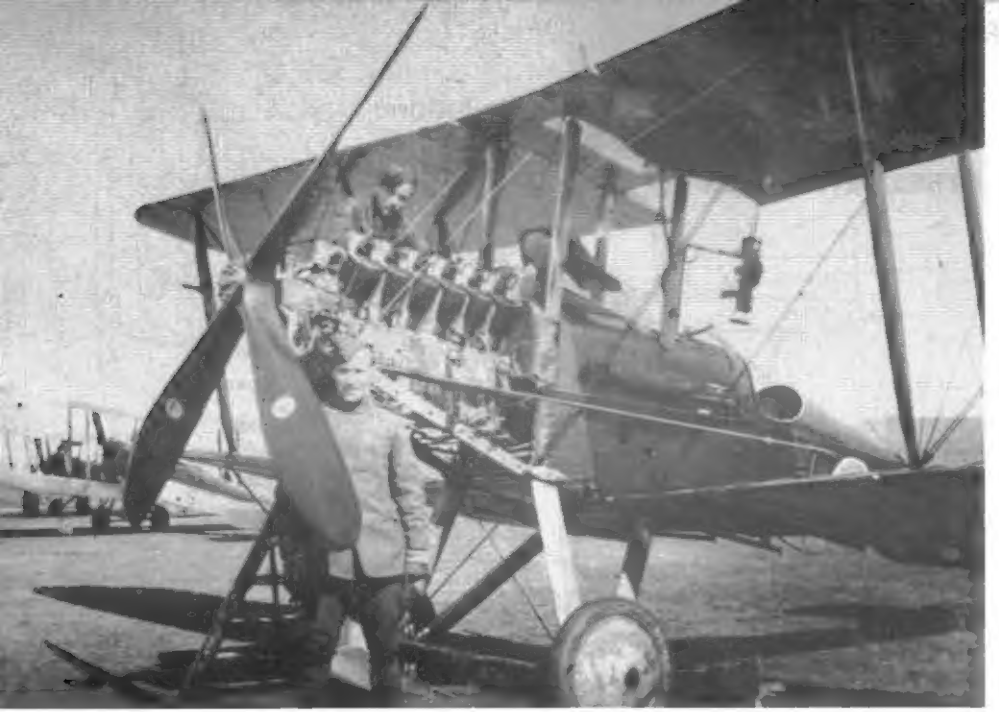
6145 was a BE12a built by the Standard Motors Company. The aircraft has a camera mount and radio antenna reel installed on the fuselage and was known to have been on strength with No 19 Squadron.

Camera Installation

All BE2/BE12 Variants



This BE12a (A.579) was built by the Coventry Ordnance Works. The aircraft featured a shortened exhaust and was configured with a reconnaissance camera on the starboard fuselage side next to the pilot's cockpit.

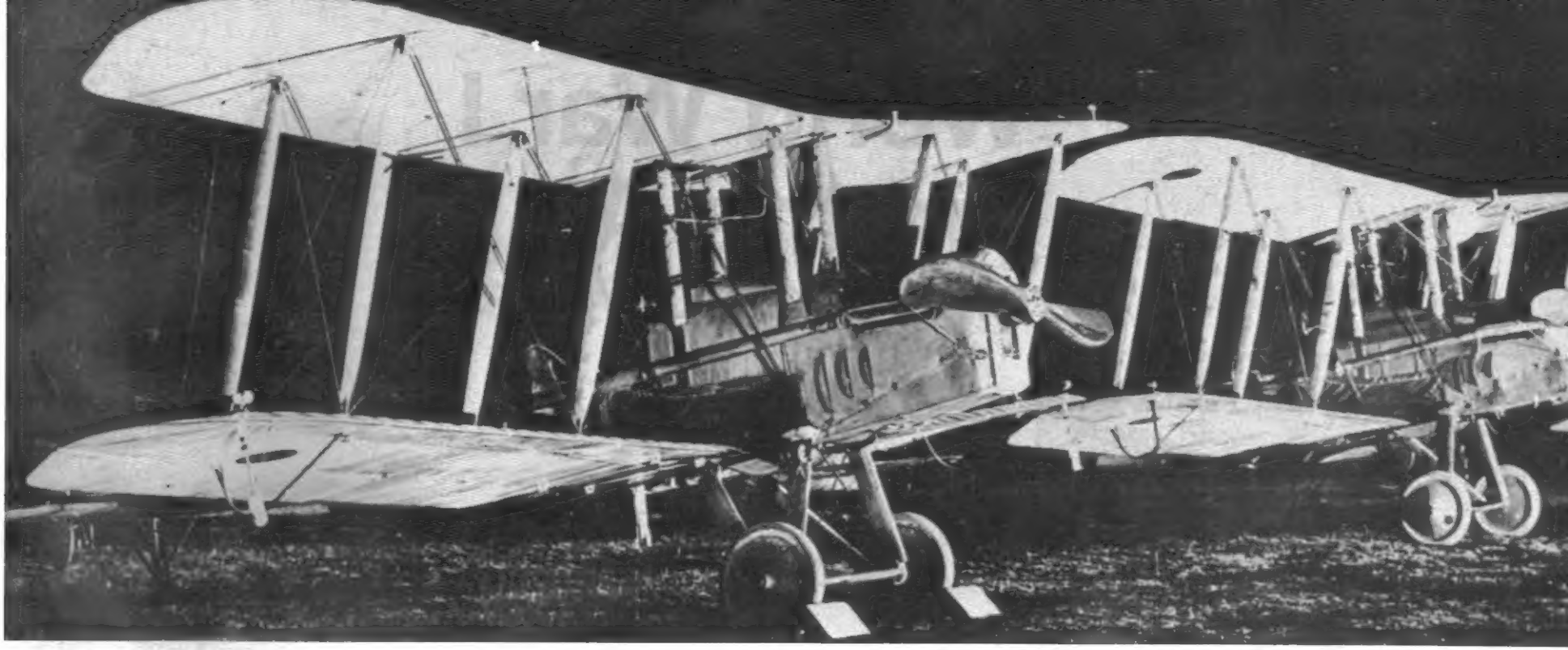


This BE12a was operated in the Middle East by either Nos 17 or 47 Squadrons. The aircraft was built by Daimler and the propeller blades appear to carry the trademark of the manufacturer, F. Tibbenham of Ipswich, which consisted of a Golden Hornet.

This BE12a is armed with rockets for Home Defense duties. It is believed that the aircraft was assigned to No 12 Squadron operating from Cramblington. The aircraft had flare brackets installed under the lower wing tips to aid in night landings.

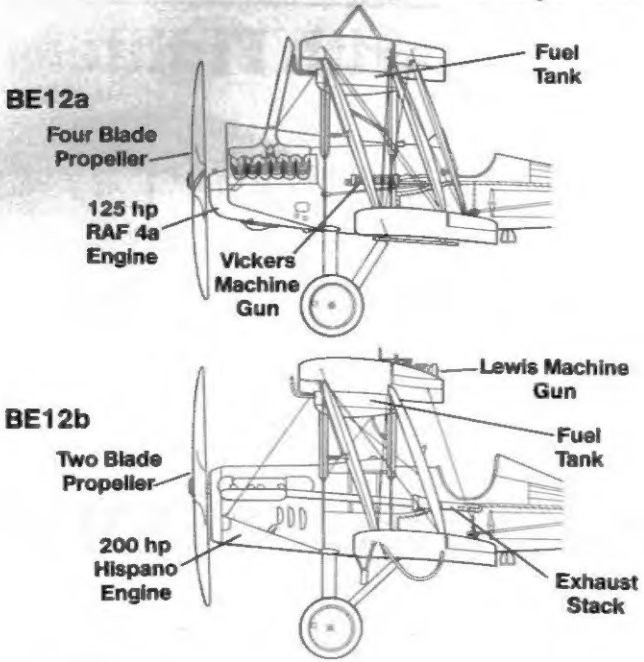
The BE12a had a .303 caliber Vickers water cooled machine gun mounted on the port side of the fuselage fixed to fire forward. The weapon was fed from an ammunition bin mounted inside the fuselage, forward of the cockpit.

This Damiler-built BE12a was delivered to Farnborough during March of 1919 and was one of two hundred BE12s built by Damiler. The aircraft was later wrecked while serving with No 76 (Home Defense) Squadron.



A pair of BE12b fighters of No 77 (Home Defense) Squadron. These aircraft were powered by 200 hp Hispano engines, the same engine that powered the SE5a. The navigation lights on the wing tips were standard equipment on the BE12b.

Fuselage Development



This BE12b of No 77 Squadron is armed with a pair of 112 pound bombs on the wing racks and a single Lewis machine gun mounted to fire over the top wing center section. The gun mount could be lowered so that the pilot could reload the gun in flight.

World War I in the Air
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1098

1110

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This BE2a of No 2 Squadron RFC, flown by LT H.D. Harvey-Kelly, was later transferred to No 1 Reserve Squadron at Farnborough.

A BE2e of the Royal Naval Air Service based at RNAS Station, Paris. The aircraft was transferred to the RNAS after seeing service with the RAF during 1917.

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